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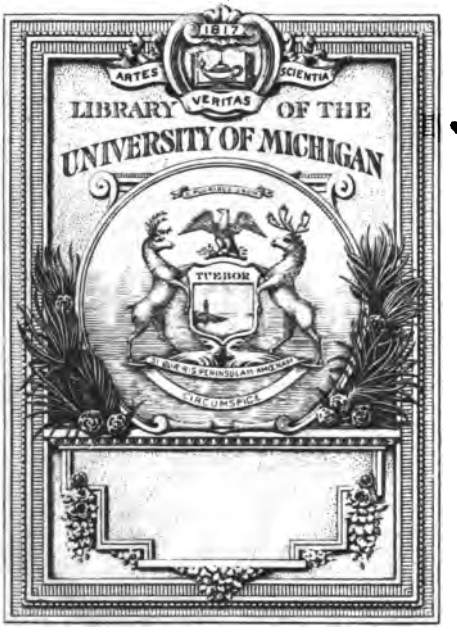
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STANIFORD'S

PRACTICAL ARITHMETIC,

IN WHICH

THE RULES ARE RENDERED SIMPLE IN THE OPERATION, AND ILLUSTRATED BY A VARIETY OF

USEFUL QUESTIONS,

CALCULATED TO GIVE THE PUPIL A FULL KNOWLEDGE OF

FIGURES,

IN THEIR APPLICATION TO TRADE AND BUSINESS;

ADAPTED PRINCIPALLY TO

FEDERAL CURRENCY;

DESIGNED AS AN ASSISTANT TO THE PRECEPTOR IN COMMUNICATING, AND TO THE PUPIL IN ACQUIRING THE

SCIENCE OF ARITHMETIC;

TO WHICH IS ADDED,

A NEW AND CONCISE SYSTEM OF

BOOK-KEEPING,

BOTH BY

SINGLE AND DOUBLE ENTRY;

THE FORMER

CALCULATED FOR THE USE OF TRADERS IN RETAIL BUSINESS, FARMERS AND MECHANICS;

AND THE LATTER

FOR WHOLESALE DOMESTIC AND FOREIGN TRADE, AS CONDUCTED IN THE

UNITED STATES.

The whole designed for the use of Schools and Academies.

BY DANIEL STANIFORD, A. M.
Author of the Art of Reading and the Elements of English Grammar.

Tantum scimus, quantum memoria tenemus.

BOSTON:
PRINTED BY J. H. A. FROST, FOR WEST, RICHARDSON & LORD,
No. 75, Cornhill.
1810

DISTRICT OF MASSACHUSETTS—TO WIT:

BE it remembered, that on the seventeenth day of November, in the year of our Lord one thousand eight hundred and eighteen, and in the forty-second year of the Independence of the United States of America, DANIEL STANIFORD, of the said district, has deposited in this office, the title of a book, the right whereof he claims as author, in the words following, to wit: "Staniford's Practical Arithmetic, in "which the rules are rendered simple in the operation, and illustrat- "ed by a variety of useful questions, calculated to give the pupil a "full knowledge of figures, in their application to trade and business; "adapted principally to Federal Currency; designed as an Assistant "to the Preceptor in communicating, and to the pupil in acquiring "the science of Arithmetic; to which is added, a new and concise "system of Book-Keeping, both by single and double entry; the "former calculated for the use of Traders in retail business, Farm- "ers and Mechanics; and the latter for wholesale, domestic and "foreign trade, as conducted in the United States. The whole de- "signed for the use of Schools and Academies, By DANIEL STANI- "FORD, A. M. Author of the Art of Reading, and Elements of Eng- "lish Grammar."

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PREFACE.

TO the question commonly asked, on the appearance of a new book, "Is there any thing new in it?" the author replies, that although the subject of arithmetic can admit but little novelty, yet in this treatise there is something new, which may be easily discovered by an examination of its contents.

The general rules in most of the Arithmetics used in our schools are too synthetical for the young Arithmetician. They contain too many principles blended together, unaccompanied with sufficient elucidations. The scholar therefore is in danger of passing over many essential parts, without fully comprehending them. One design therefore of this treatise is to give an Analysis of these general rules, resolving them into their simple constituent parts, illustrating them by easy practical questions.

As the work, also, is principally designed to furnish a system of practical Arithmetic, adapted to the currency of the United States, all mathematical demonstrations are purposely omitted, to give place to clear illustrations of the rules by easy examples, and such as tend to prepare the scholar for business; referring those, who wish to acquire a knowledge of the higher branches of the Mathematics in those elaborate, though useful parts of the science, to authors particularly designed for the purpose. This omission will leave for the instructor enough for the exercise of his skill in explaining the nature of each rule to the pupil, as he advances in his pursuit, and becomes capable of comprehending those abstruse parts of the science. The instructor is left, also, to supply at his discretion various additional questions for exercise in the application of the several rules. This will prevent the fatal practice, too much indulged among scholars, of copying from each other's manuscripts. The same question should never be proposed by the instructor a second time.

Although the currency of the United States is generally adopted through the work, yet, as the accounts and invoices of goods of American and English merchants trading together are kept in Sterling money, so much only of that money is applied as was thought necessary to give the scholar a competent knowledge to transact that part of commercial business.

The whole arrangement of the work is founded on the natural dependence of the several parts on each other for their respective operations. A few remarks are offered in support of the present arrangement.

1. REDUCTION. As by this rule compound addition, multiplication and division are performed, its place naturally precedes them. In reducing time 365 days is commonly called a year, omitting the fractional parts.

2. VULGAR FRACTIONS. These, having their origin from simple division, seem to require a place immediately subsequent to that rule; yet as their operation depends on other rules, a place is assigned them, following those on which they are dependent, and preceding others which depend on them for an accurate solution. Vulgar Fractions being indispensably necessary for the solution of many important questions in common arithmetic as well as in the higher branches of Mathematics, they have received particular attention in this treatise.

3. DECIMAL FRACTIONS. These being similar in their operation with whole numbers, seem to claim a place in close connexion with them; yet as the changing of them from one form into another is performed by other rules, their order should succeed them.

4. CIRCULATING DECIMALS. These are subjoined for the benefit of those who would wish to have a comprehensive view of the whole nature and doctrine of Decimals; particularly for those who wish to extend their mathematical enquiries. The finite decimals are contained in the first cases, and are all that is necessary for common business; the circulates may, therefore, be omitted as circumstances may justify.

5. FEDERAL MONEY. Some, perhaps, may have thought it more proper to arrange this currency immediately following the simple rules of Arithmetic, because of their simplicity; yet as Federal Money is founded in the nature and principles of Decimals, and performed by the same rules in its operation, its natural order is certainly subsequent to decimals. Particular attention has been given to it in connexion with decimals, as the foundation and only guide for the American Accountant.

6. The operations of Practice, Tare and Tret, with Duodecimals, being dependent on Compound Multiplication and Division, are placed after them.

7. RULE OF THREE. The importance and extensive utility of this rule in the ordinary concerns of life, has given it the distinguishing title of "*The golden Rule.*" As most of the subsequent rules in Arithmetic are performed by the Rule of Three, great care has been taken to render it intelligible by a minute investigation of its nature, with an analysis of the general rule in simplifying it in all its varieties.

8. Position, Allegation and Permutation are inserted at the close of the Practical Arithmetic, more for the purpose of gratifying curiosity, than for their utility in business.

In executing the work nothing superfluous has been added, and nothing omitted that would contribute to perfect its design, and render it serviceable to youth. Those, however, who are in the habit of teaching superficially, with a view of flattering the pupil and the parent with the mistaken idea of extraordinary progress, may probably raise objections against the work, as containing too many things to be committed to memory. They will burden, fatigue and confuse the mind of the scholar. Such persons have yet to learn both the susceptibility and capacity of the young mind, and that although a *single* complex idea in its undigested form, crowded into the mind of a child, may confuse and embarrass it; yet, in direct proportion to the number of simple ones, impressed, will it become more invigorated, more enlightened, more improved. Similar objections would as readily be started against an abridgement of the *smallest size*, by those *only* who have neither the ability nor inclination to lay the whole nature of the subject open to the understanding, and lead the pupil, gradually, into that train of logical reasoning, peculiar to the mathematics.

9. Book-Keeping. This useful branch of learning has been almost totally neglected in our schools and academies. The neglect of a study so essential to the best literary interest of youth proves a material defect in the present system of education. It may, perhaps, be attributable, in a great degree, to the want of a concise treatise on the subject, divested of those numerous difficulties which envelope in mystery even the best system extant. So intricate and tedious are they, for the most part, that even instructors themselves have been deterred from giving instruction by them.

The short system in this publication has been used by the author with considerable success. It is now offered as an attempt to simplify the Art of Book-keeping, and to adapt it to the capacity of youth. It furnishes such rules and explanatory remarks in discriminating the titles of Dr. and Cr. in journalizing and posting the several mercantile transactions, as were thought best calculated to render easy and clear a subject of so much importance.

Of such immense benefit is this part of science to a young man of any respectable standing in society, that no scholar should be permitted to leave school, to become an apprentice either to a merchant, a mechanic, or even to a farmer, without a thorough knowledge of the principles and forms of Book-keeping; as on his knowledge of this art essentially depends the security of all the fruits of his industry through life. Many mechanics and farmers have lost half their earnings by neglecting to make a regular entry of their daily transactions peculiar to their employment; and even wealthy merchants

have become the melancholy objects of penury and distress through the same neglect.

The best interest of youth would be essentially promoted, were this important branch of science introduced into our schools, and to constitute a prominent part of their education.

The work, with its trifling errors, is now presented to the public in full confidence that it will meet the acceptance it deserves. It claims no preference to the numerous publications on this subject. The author asks that patronage only, to which it is entitled by its real merits. And if, kind reader, you can find a better treatise, freely adopt it; "At si non rectius invenire potes, hoc utere mecum;" And in either case it will be perfectly satisfactory to

THE AUTHOR.

Boston, September 30, 1818.

The following typographical errors have escaped timely attention, which the reader is respectfully requested to correct on the margin of the page referred to in the table of

ERRATA.

Page
16—Exam. 7, multiplicand, for 84 read 48.
20—Exam. 9, dividend, for 467 read 464.
26—Dry measure, for 4 gals. read 2 gals.
29—Question 18, insert 2 yds.
30—Exam. 30, after 37÷, insert 15=.
33—Question 13, insert cwt. after 9 1-2, also, lb. after 31920.
33— 15, Ans. for drs. read oz.
40—Exam. 11, Long measure, subtrahend, for 2 yds. read 4 yds.
43—Exam. 12, Time, in Ans. for 3 weeks read 0.
63—Note first, for numerator read denominator, and for denom. read numerator.
64—Question 6, for *divided* read *multiplied*.
67—Case II, line 4, for *left* read *right*.
67—Exam. 4, dele the second 2,
80—Exam. 12, in quotient, for 75 read 25.
109—Exam. 26, for 14*d*. read 4*d*.
114—Question 5, in Ans. for 86,6 2-3 read 85,5 5-9.
117—Exam. 13, Ans. for 59 gals. read 62 gals.
156—Line 7th from top, for 00 read 700.
172—Line 9th from bottom, dele 0 in dividend.
181 and 182, for proportion read proposition.
256—Personal accounts, first line, for *Dr*. read *Cr*. also in second line, for *Cr*. read *Dr*.
290—Dr. Sugar, for 589 read 549.
4—Preface, remark 5, for *simplicity* read *similarity*.
40—Exam. 10, for *scr*. *grs*. read *drs*. *scr*.
48—Exam. 4, Ans. for 1-2 read 1-4.
58—Case IX. for *denominator* read *numerator*.
78—Exam. 2, dele 0 in dividend, also 7 in quotient.
96—Second method, top line, in dollars insert 8.
167—Exchange, France, for 4 6*d*. sterl. exchange at par. read 2 6*d*. sterling.
192—Ans. 4, decimal, dele second 3.

RECOMMENDATIONS.

Boston, October 8th, 1818.

AT the Annual Meeting of the "ASSOCIATED INSTRUCTERS OF YOUTH IN THE TOWN OF BOSTON AND ELSEWHERE," the following Report of a Committee was made and accepted, viz:

"The Committee appointed by the Association to examine a Treatise, entitled, 'Practical Arithmetic, and a short System of Book-keeping,' by DANIEL STANIFORD, A. M. have attended to that service, and after a careful examination, are of opinion, that it is a work, better calculated to facilitate the progress of youth, in these useful and important sciences, than any treatise of the kind, of which we have any knowledge.

Signed, JONA. SNELLING, J. R. COTTING, BENJAMIN HOLT, } *Committee.*

A true copy from the records and files of the Association.

Attest, THOS. PAYSON, *Sec. A. I. Y.*

THE undersigned having attentively examined a treatise on "Book-keeping," By Daniel Staniford, A. M. are of opinion that it is better calculated to give pupils a knowledge of the rudiments of this important science, then any one of the kind we have hitherto seen.

The introduction contains a large number of valuable rules for journalizing and posting, which are too often omitted in treatises of this kind; and the several accounts in the Waste-book are so judiciously arranged as examples to each rule, that they may be readily comprehended by the learner. We sincerely hope that it will have a general circulation in our schools and academies.

J. COTTING,
EDWARD JEWETT.

Explanation of the Characters used in the following Work.

=	Equal. The sign of equality; as 4 qrs. =1 cwt.
+	Plus, or more. The sign of Addition; as 8+4=12.
—	Minus, or less. The sign of Subtraction; as 6—4=2.
×	Multiplied by. The sign of Multiplication; 4×3=12. Letters joined like a word express the continual multiplication of them as, apr=a×p×r.
÷	Divided by. The sign of Division; as, 12÷4=3. Division is likewise expressed by numbers placed in the form of a fraction; as $\frac{27}{3}=9$. Letters also placed in the form of a fraction signify that the upper letters are to be divided by the lower.
: : : :	The sign of Proportion; as 4 : 8 :: 12 : 24, that is, as 4 is to 8, so is 12 to 24.
$\square^2$, or 3^2,	Signifies the second power, or square.
$\square^3$, or 4^3,	Signifies the third power, or cube.
$\surd$	Signifies the square root.
$3\surd$	Signifies the cube root.

Note. The number belonging to the above signs of powers, and roots, is called the index or exponent.

A line or vinculum, drawn over several numbers, signifies, that the numbers under it are to be considered *jointly*; as $8-\overline{3+4}=1$ but without the line, $8-3+4=9$.

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PRACTICAL ARITHMETIC.

ARITHMETIC is the art of computing by numbers.

Number is that which answers directly to the question, "How many?" and is either an unit, a multitude of units, part or parts of an unit, or a mixt expression.

The whole art of Arithmetic is comprehended in the various operations of the five following rules, viz.

1. Numeration, or Notation.
2. Addition.
3. Subtraction.
4. Multiplication.
5. Division.

Practical Arithmetic is the application of the preceding fundamental rules, so as to be most useful in business.

NUMERATION.

NUMERATION teaches to read, or write, any number.

All numbers are expressed by ten characters, called figures, or digits, viz. 1, 2, 3, 4, 5, 6, 7, 8, 9, 0. The nine first are called significant figures; the last, a cipher, or nought.

The cipher is of no value when it stands alone, or at the left hand of a whole number; but, when annexed to any significant figure, it increases its value ten-fold.

The simple value of any figure may be known by inspection, and the following table plainly shows the local value of any figure from the place of units towards the left hand, as far as may answer every purpose of calculation.

NUMERATION TABLE.

3d period			2d period			1st period		
C. Millions.	X. Millions.	Millions.	C. Thousands.	X. Thousands.	Thousands.	Hundreds.	Tens.	Units.
9	8	7.	6	5	4.	3	2	1
9	0	0.	0	0	0.	0	0	0
	8	0.	0	0	0.	0	0	0
		7.	0	0	0.	0	0	0
			6	0	0.	0	0	0
				5	0.	0	0	0
					4.	0	0	0
						3	0	0
							2	0
								1

Rule. There are three periods; the first on the right hand, *Units;* the second *Thousands;* and the third *Millions*, each of which consists of three places or figures. Reckon the third figure of each period, from the left hand, so many *Hundreds*, the next *Tens*, and the other, so many *Units*, of what is written over them; as the first period on the left hand, read thus, Nine hundred eighty-seven *millions;* the second period, Six hundred fifty-four *thousands;* and the other period, Three hundred and twenty-one *units.*

It is obvious, that numbers increase in a ten-fold proportion from the right hand towards the left; that is, any

figure, in the place of tens, is ten times the value of the same figure in the place of units; and any figure in the place of *hundreds*, is ten times the value of the same figure in the place of tens, &c.

Case I.

To read any number.

Rule. Find out the place of each figure by the Table, and to the simple value of each figure join the name of its place, beginning at the left hand, and reading towards the right.

Examples.

Read the following numbers.

21
321
4321
54321
654321
7654321
87654321
987654321

Case II.

To write any number in figures.

Rule. Write down ciphers to as many periods, or places, as are named in the given number; then, beginning at the left hand, observe, at each place, what significant figure is named, and, taking away the cipher, write the significant figure in its place.

Examples.

Write in figures the following:—

Five hundred and twenty-four.
Nine thousand, seven hundred and ten.
One hundred millions, one hundred thousand, and ten.
One hundred millions and one.

Numeration by Roman Letters.

I.	One.	XXX.	Thirty.
II.*	Two.	XL.	Forty.
III.	Three.	L.	Fifty.
IV.†	Four.	LX.	Sixty.
V.	Five.	LXX.	Seventy.
VI.‡	Six.	LXXX.	Eighty.
VII.	Seven.	XC.	Ninety.
VIII.	Eight.	C.	Hundred.
IX.	Nine.	CC.	Two Hundred.
X.	Ten.	CCC.	Three Hundred.
XI.	Eleven.	CCCC.	Four Hundred.
XII.	Twelve.	D.	Five Hundred.
XIII.	Thirteen.	DC.	Six Hundred.
XIV.	Fourteen.	DCC.	Seven Hundred.
XV.	Fifteen.	DCCC.	Eight Hundred.
XVI.	Sixteen.	DCCCC.	Nine Hundred.
XVII.	Seventeen.	M.	Thousand.
XVIII.	Eighteen.	MDCCCXVIII.	Eighteen hundred and eighteen.
XIX.	Nineteen.		
XX.	Twenty.		

SIMPLE ADDITION.

ADDITION is the collecting of several numbers of the same denomination into one sum.

RULE. Place the numbers under each other according to the value of their places, by putting units under units, tens under tens, &c.; then, beginning at the right hand column, add the figures in it, and set down the units, and carry the tens to the next left hand column, continuing so to do to the last column, under which set down its whole amount.

The total amount in addition is called the *sum*.

PROOF. Add the figures downwards in the same manner as they were added upwards, and the sum will be the same.

* As often as any character is repeated, so many times its value is repeated.

† A less character before a greater diminishes its value.

‡ A less character after a greater increases its value.

EXAMPLES.

4874835	8433487
7367485	4783438
4363567	4365687
8934874	8749863
25540761	26332475

SIMPLE SUBTRACTION.

SUBTRACTION teaches to find the difference between two numbers of the same denomination.

It has three parts, viz.

1. The greater number, or the minuend.
2. The less number, or the subtrahend.
3. The difference, or remainder.

RULE. 1. Place the less number under the greater, according to their value, as in addition.

2. Beginning at the right hand, subtract each under figure, from that which stands above it, setting the remainder under them, and the several remainders together will express the difference required.

3. If the under figure is greater than that above it, borrow ten and add it to the upper figure, from which sum take the under figure, setting down the remainder as before; remembering, that every time ten is borrowed, to carry one to the next under figure, before it is subtracted.

PROOF. Add the difference to the less number, and their sum will be equal to the greater.

EXAMPLES.

8734874	Minuend.	83010014	834874
4837841	Subtrahend.	378749	18700
3897033	Difference.	82631265	816174
8734874	Proof.		

QUESTIONS.

1. If I lend my friend $9480 and receive in part payment $1987; how much remains due? Ans. $7493.

2. The revolutionary war in America commenced with Great Britain, in the year 1775, (April 19); how many years since, the present year being 1818? Ans. 43 years.

3. Peace between the United States and Great Britain took place in 1783, and war again declared in 1812; how long did the peace continue? Ans. 29 years.

SIMPLE MULTIPLICATION.

SIMPLE MULTIPLICATION is a short method of performing many additions.

It has three parts, viz.

1. The Multiplicand, or sum multiplied.
2. The Multiplier, or sum multiplied by.
3. The Product, or number found by the operation.

NOTE. The Multiplicand and Multiplier are called the factors.

MULTIPLICATION AND DIVISION TABLE.

2 Times	2	are	4	4 Times	4	are	16	7 Times	7	are	49
	3		6		5		20		8		56
	4		8		6		24		9		63
	5		10		7		28		10		70
	6		12		8		32		11		77
	7		14		9		36		12		84
	8		16		10		40	8 Times	8	are	64
	9		18		11		44		9		72
	10		20		12		48		10		80
	11		22	5 Times	5	are	25		11		88
	12		24		6		30		12		96
					7		35	9 Times	9	are	81
3 Times	3	are	9		8		40		10		90
	4		12		9		45		11		99
	5		15		10		50		12		108
	6		18		11		55				
	7		21		12		60	10 Times	10	are	100
	8		24	6 Times	6	are	36		11		110
	9		27		7		42		12		120
	10		30		8		48				
	11		33		9		54	11 Times	11	are	121
	12		36		10		60		12		132
					11		66				
					12		72	12 Times	12	are	144

NOTE. The pupil should be instructed to change the multiplier in the preceding table. *Example*—6 times 8, or 8 times 6, are 48, and so for the rest.

General Rule.

1. Place the multiplier under the multiplicand according to the value of the figures, as in addition.

2. Beginning at the right hand, multiply each figure in the multiplicand by each in the multiplier, placing the first figure of every line directly under its respective multiplier, and to the product of the next figure carry one for every ten, as in addition.

3. Add the several products together, and their sum will be the total product required.

Proof. Make the multiplicand the multiplier and the multiplier the multiplicand, and proceed as before in the operation, if the product is like the former the work is right.

Case I.

When the multiplier is not more than 12.

Rule. Multiply the given number by the whole multiplier.

Examples.

1.		2.
87487487	Multiplicand.	4387936
8	Multiplier.	9
699899896	Product.	39491424

3.		4.
7009748		43498746
11		12
77107228		521984952

Case II.

When the multiplier is more than 12, and such as two or more numbers in the table, when multiplied together, will make it.

Rule. Multiply the given number by one of these figures, and the product by the other; the last product will be the answer.

EXAMPLES.

	5.		6.	
Multiply	389074	by 24.	8350746	by 48.
4×6=24.	4		6	6×8=48.
	1556296		50104476	
	6		8	
	9337776		400835808	

CASE III.

When the multiplier consists of several figures.

RULE. Multiply each figure in the multiplicand as directed in the general rule.

EXAMPLES.

7.	8.
847483567	749084
768	759
3899868536	6741756
2924901402	3745420
3412384969	5243588
374387379456	568554756

CASE IV.

When there are ciphers either in the multiplicand or multiplier, or in both.

RULE. Omit the ciphers and multiply by the significant figures, as before directed; and to the product annex as many ciphers as are given in both the factors.

EXAMPLES.

9.	10.	11.
87487487	8740084500	98736500
120	11	900
10498498440	96140929500	88862850000

Case V.

When there are ciphers between the significant figures of the multiplier.

Rule. Omit them in the operation, and multiply by the significant figures, placing the first figure of each product under its respective multiplier.

Examples.

12.	13.
48748043	48748744
40007	9003
341236301	146246232
194992172	438738696
1950262956301	438884942232

Case VI.

To multiply by 10, 100, 1000, &c.

Rule. To the given number annex as many ciphers as there are in the multiplier.

Examples.

Multiply 78 by 10, 100, and 1000. Product. 780 . . . . 7800 . . 78000. } To multiply by parts, see Division Case VII.

SIMPLE DIVISION.

Simple Division shows how often one number is contained in another, of the same denomination.

It has four parts; viz.

1. The Dividend, or sum divided.
2. The Divisor, or sum divided by.
3. The Quotient, or answer.
4. The Remainder, or what is left after division.

The remainder is of the same name with the dividend and quotient, and must always be less than the divisor.

Proof. Multiply the quotient by the divisor, add the remainder, if any, to the product, and the sum will be equal to the dividend.

Case I.

When the divisor is not more than 12, it is called Short Division; then the quotient is placed under the dividend.

Rule. 1. Find how often the divisor is contained in the first figure, or figures of the dividend, setting it under the dividend, and carrying the remainder, if any, to the next figure, as so many tens.

2. Find how often the divisor is contained in this dividend, and set it down as before, continuing so to do, till all the figures in the dividend are used.

Note. The work in Short Division is done *mentally*, that is, divided in the mind, and the result only written down; whereas in Long Division the operation is written at large.

Examples.

	1.	2.
Divisor.	8)38748747	9)876874854
	Rem.	
Quotient.	4843593—3	97430539—3
	8	
Proof.	38748747	

Note. When there is no remainder, the quotient is the perfect answer to the question; but if there is a remainder, set it at the end of the quotient, above a small line with the divisor under it, which is part of another unit. Hence the origin of Vulgar Fractions, the remainder being the numerator, and the divisor the denominator, which will be particularly explained in their proper place.

3.	4.
11)7387487487	12)87487487
671589771–6 rem.	7290623–11 rem.

Case II.

Long Division is when the divisor exceeds 12, then the quotient must be placed at the right hand of the dividend.

Rule. 1. Having written the divisor at the left hand of the dividend, find how many times the divisor is contained

in the first figure of the dividend, or if not in the *first*, how many times it is contained in the *two first* figures, and place the number at the right hand of the dividend for the quotient figure.

2. Multiply the divisor by the quotient figure, and place the product under the dividend.

3. Subtract this product from the dividend, and to the remainder bring down the next figure in the dividend, and write in the quotient the number of times the divisor is contained in this new dividend.

4. Multiply the divisor by the last quotient figure and proceed as before directed; thus continue to do till all the figures in the dividend are brought down.

If the remainder, after having brought down a figure, is still less than the divisor, a cipher must be carried to the quotient, and another figure brought down, and wrought as before directed.

EXAMPLES.

5.

Divisor. *Dividend.* *Quotient.*

24)34748748(1447864$\frac{1}{2}$

24

107
96

114
96

188
168

207
192

154
144

108
96

12 Remainder.

6.

48)74848748(1559348$\frac{11}{12}$

48

268
240

284
240

448
432

167
144

234
192

428
384

44 Remainder.

NOTE. The fraction must always be reduced to its lowest terms before it is annexed to the quotient, as in the two last Examples.

Case III.

When the divisor is a composite number, that is, such as two or more figures in the table, when multiplied together, will make it.

Rule. Divide the dividend by one of these figures, and the quotient by the other; the last quotient will be the answer.

Examples.

7.

Divide 84874 by 48.

6×8=48.

6)84874

8)14145–4 1st rem.

1768–1 2d rem.

8.

Divide 487488 by 84.

7×12=84.

7)487488

12) 69641–1 1st re.

5803–5 2d rem.

Note. To find the true remainder, when there is a remainder to each of the quotients.

Rule. Multiply the first divisor into the last remainder, to the product add the first remainder, the sum will be the true remainder.

Thus in example 7. The first divisor 6×1 the last remainder is 6, to which add 4 the first remainder, the sum is 10 equal to the true remainder.

Case IV.

When there are ciphers in the divisor.

Rule. Cut them off, and as many places from the right hand of the dividend; but they must be annexed to the remainder.

Examples.

9.

12,000)467567,000

38713—11000 Rem.

10.

11,00)435678,34

39607—134 Rem.

Case V.

To divide by 10, 100, 1000, &c.

Rule. Cut off as many places from the right hand of the dividend, as there are ciphers in the divisor, the left hand figures will be the quotient, and the right hand figures cut off will be the remainder.

EXAMPLES.

11. Divide 787484 by 10. . . Answer, $78748\frac{4}{10}$
12. . . . 787484 by 100. . . Answer, $7874\frac{84}{100}$
13. . . . 787484 by 1000. . Answer, $787\frac{484}{1000}$

CASE VI.

To divide by fractions, or parts of an unit.

RULE. If the numerator, or upper figure, is an unit, multiply the given number by the denominator, or under figure, and the product will be the answer: but if the numerator is more than an unit, multiply the given number by the denominator, and divide the product by the numerator.

EXAMPLES.

14. Divide 848 by $\frac{1}{4}$.
4=denominator.
3392 Answer.

16. Divide 484 by $\frac{1}{2}$.
2=denomina.
968 Answer.

15. Divide 483 by $\frac{3}{4}$.
4=denominator.
Numer. 3)1932
644 Answer.

17. Divide 496 by $\frac{3}{8}$.
8=denomina.
Numer. 3)3968
$1322\frac{2}{3}$ Answer.

CASE VII.

To multiply by fractions, or parts of an unit.

RULE. If the numerator is an unit, divide the given number by the denominator, and the quotient will be the answer; but if the numerator exceeds an unit, multiply the given number by the numerator, and divide the product by the denominator, the quotient will be the answer.

EXAMPLES.

18. Multiply 843 by $\frac{1}{4}$.
Denomin. 4)843
$210\frac{3}{4}$ Ans.

19. Multiply 874 by $\frac{1}{2}$.
Denomin. 2)874
437 Ans.

20. Multiply 8740 by $\frac{3}{4}$. 3=Numerat.

Denom. 4)26220

6555 Ans.

21. Multiply 840 by $\frac{5}{8}$. 5=Numerat.

Denom. 8)4200

525 Ans.

TABLES OF COINS, WEIGHTS, AND MEASURES.

1. English Money.

4 Farthings, marked qrs. make 1 Penny, marked d.
12 Pence . . . . . 1 Shilling, . . s.
20 Shillings . . . . . 1 Pound, . . . £.

Note. 4d=1 groat.

Pence Table.

Pence.	*s.*	*d.*	*Shillings.*	*d.*	*Shillings.*	*£.*	*s.*
20 equal to	1	8	2 equal to	24	20 equal to	1	
30 . . .	2	6	3	36	30 . . .	1	10
40 . . .	3	4	4	48	40 . . .	2	
50 . . .	4	2	5	60	50 . . .	2	10
60 . . .	5	0	6	72	60 . . .	3	
70 . . .	5	10	7	84	70 . . .	3	10
80 . . .	6	8	8	96	80 . . .	4	
90 . . .	7	6	9	108	90 . . .	4	10
100 . . .	8	4	10	120	100 . . .	5	
110 . . .	9	2	11	132	110 . . .	5	10
120 . . .	10	0	12	144	120 . . .	6	

COMPARATIVE VALUE OF COINS.

	Lawful.	*Sterl.*	*Fed. Mon.*
A Guinea =	£1 8=	£1 1=	$4 66 2-3
Doubloon =	4 8=	3 6=	14 66 2-3
Johanna =	2 8=	1 16=	8
Dou. Joh. =	4 16=	3 12=	16
Moidore =	1 16=	1 7=	6
Pistole =	1 2=	0 16.6=	3 77 1-3
Crown =	0 6.8=	0 5=	1 10
Spanish doll.	0 6=	4.6=	1
Engl. shil. =	1.4=	1=	22 2-9
French Frank		1.1½=	18 1-2
P'd. ster 'g. in Ireland=	1	0.0=	4 10
Pound sterling . . . =	1	0.0=	4 44 1-2

Pagoda of China=	$1 94
Tale of China =	1 48
Milrea of Portu.=	1 25
Livre Tournois =	18 1-2
Rix dol. of Den.=	1
Guilder or Florin=	40
Ruble of Russia=	66
Rupee of Bengal=	55 1-2
Marco Banco of Hamburgh =	33 1-3
Real Plate of Spain. =	10

2. Troy Weight.

24 Grains,	marked grs.	make 1 Pennyweight,	marked pwt.
20 Pennyweights	. . .	1 Ounce, ...	oz.
12 Ounces		1 Pound, ...	lb.

Note. By Troy Weight, all jewels, gold, silver, electuaries, and liquors, are weighed.

3. Avoirdupois Weight.

16 Drams,	marked drs.	make 1 Ounce, ...	marked . . . oz.
16 Ounces		1 Pound, ...	lb.
28 Pounds		1 Quarter of a cwt. .	qr.
4 Quarters		1 hundred cwt. or 112 lbs.	cwt.
20 Hundred Weight . .		1 Ton, ...	T.

Note 1. By this weight all coarse and drossy goods are sold, and all metals, except gold and silver.

2. In Avoirdupois Weight several other denominations are used in particular goods: viz.

A bbl. of Pot Ashes,	=200 lbs.	144 dozen, .	=1 great gross.
A bbl. of Pork, .	=220 lbs.	20 particular things,	=1 score.
A bbl. of Beef, .	=220 lbs.	5 do. do.	=1 tally.
A quintal of Fish,	=112 lbs.	24 sheets of Paper,	=1 quire.
12 particular things,	=1 dozen.	20 quires, . . .	=1 ream.
12 dozen, . . .	=1 gross.		

4. Apothecaries' Weight.

20 Grains,	marked grs. .	make 1 Scruple, .	marked ℈
3 Scruples		1 Dram, ...	ʒ
8 Drams		1 Ounce, ...	℥
12 Ounces		1 Pound, ...	lb

Note. Apothecaries mix their medicines by this weight, but buy and sell their commodities by Avoirdupois. It is the same as Troy Weight, except its having some different divisions.

5. Long Measure.

3	Barley-corns, marked bar.	make 1 Inch, marked	in.
12	Inches	1 Foot,	ft.
3	Feet	1 Yard,	yd.
5½	Yards, or 16½ Feet	1 Rod, Perch, or Pole,	pol.
40	Rods, Perches, or Poles, or 132 Paces	1 Furlong,	fur.
8	Furlongs	1 Mile,	mile.
60	Miles on the equator	1 Degree,	°
360	Degrees	1 Great Circle of the Earth.	

Note 1. This measure is used to ascertain the distances of places, or any thing which has length only.

2. Distances are measured with a chain 4 rods long, containing 100 links.

3. 4 inches, = a hand. | 5 feet, = a geometrical pace.
6 feet, = a fathom. | 66 feet, = a gunter's chain.
3 miles, = a league. | $7\frac{92}{100}$ inch, = a link.

6. Cloth Measure.

2¼	Inches, marked in.	make 1 Nail, marked	n.
4	Nails	1 Quarter,	qr.
4	Quarters	1 Yard,	yd.
3	Quarters	1 Flemish Ell,	Fl.E.
5	Quarters	1 English Ell,	E.E.
6	Quarters	1 French Ell,	Fr.E.
4	Quarters	1 Scotch Ell,	S.E.

7. Time.

60	Seconds, marked sec.	make 1 Minute, marked	m.
60	Minutes	1 Hour,	h.
24	Hours	1 Day,	d.
7	Days	1 Week,	w.
4	Weeks	1 Month,	mo.
13	Months, 1 Day, 6 Hours	1 Year,	yr.
365¼	Days	1 Year,	yr.
52	Weeks	1 Year,	yr.
100	Years	1 Century,	C.

Note. When the year of the Christian Era, can be divided by 4, without a remainder, it is then Bissextile, or Leap Year; the remainder, if any, shows what year it is after Leap Year.

8. Circular Motion.

60	Seconds, marked ″	make 1	Prime or Minute, marked ′
60	Minutes	1	Degree, ... °
30	Degrees	1	Sign, ... S
12	Signs, or 360° . . .	1	Circle of the Zodiac.

Note. The Zodiac is a space of 16 degrees wide, within which the motions of all the planets are performed, except the newly discovered Asteroids.

9. Land, or Square Measure.

144	Inches, marked in.	make 1	Square Foot, marked ft.
9	Feet	1	Square Yard, . . yd.
30¼	Yards, or 272¼ Feet .	1	Rod, ... rod.
40	Poles, or Rods . . .	1	Rood, ... rood.
4	Roods, or 160 Rods .	1	Acre, ... acre.
620	Acres	1	Mile, ... mile.

Note. Land is measured by the chain.

10. Solid Measure.

1728	Inches, marked in.	make 1	Solid, or Cubic Foot.
27	Feet	1	Yard.
40	Feet round timber . . .	1	Ton, or Load.
50	Feet hewn timber . . .	1	Ton, or Load.
128	Solid Feet, that is, 8 feet in length, 4 in breadth, and 4 in height, ...	1	Cord of Wood.

Note. All things which have length, breadth, and depth, are measured by Solid or Cubic Measure.

11. Wine Measure.

2	Pints, marked pts.	make 1	Quart, marked qrt.
4	Quarts	1	Gallon, . . . gal.
42	Gallons	1	Tierce, . . . tier.
63	Gallons	1	Hogshead, . . hhd.
84	Gallons	1	Puncheon, . . pun.
2	Hogsheads	1	Pipe, or Butt, . pi. b.
2	Pipes	1	Tun, ... T.
31½	Gallons	1	Barrel, . . . bar.

Note. By this measure all brandies, spirits, perry, cider, mead, vinegar, and oil, are measured.

12. Ale, or Beer Measure.

2	Pints, marked pts.	make 1	Quart, marked qrt.
4	Quarts	1	Gallon, . . . gal.
54	Gallons	1	Hogshead of beer, hhd.
2	Barrels	1	Puncheon, . . pun.
3	Barrels, or 2 Hogshead .	1	Butt, . . . butt.

13. Dry Measure.

2	Pints, marked pts.	make 1	Quart, marked qrt.
4	Gallons	1	Peck, ... pe.
4	Pecks, or 5 Pecks water measure . . .	1	Bushel, . . . bus.
32	Bushels	1	Chaldron, . . ch.
36	Bushels	1	Chaldron in London, ch.

Note. Salt, coal, sand, fruits, oysters, roots, corn, and dry goods, are measured by Dry Measure.

REDUCTION.

Reduction teaches to exchange numbers of one denomination to another, retaining the same value.

It consists of two sorts; viz. Descending and Ascending.

Case I.

Reduction Descending is bringing a greater denomination into a less.

General Rule.

Multiply the highest denomination given by so many of the next less, as make one of that greater, and thus continue to do till the number is brought into the denomination required.

EXAMPLES.

1. In £945, how many pence?

£945
20=shillings in a pound.

18900=shillings.
12=pence in a shilling.

226800=pence. Ans. 226800.

PROOF. As Reduction Descending is performed by multiplication, it is proved by division; that is, by changing the order of the question, and dividing the last product by the last multiplier.

In the preceding question the order will be, In 226800 pence, how many pounds?

Last mult. 12)226800=last product.

2,0)1890,0

£945 Ans. as above. Ans. £945.

CASE II.

To reduce a mixt number to a less denomination.

RULE. Multiply the highest denomination as before directed, adding the less units, which stand in the given number to the products, which are of the same name.

EXAMPLES.

2. In £344 18 4½ how many farthings?

20

6898+18 shillings.
12

82780+4 pence.
4

331122+2 farthings. Ans. 331122 qrs.

1. MONEY.

3. In £35, how many shillings? Ans. 700 s.
4. In 35 guineas, how many pence? Ans. 11760 d.
5. In £348 12 8½ how many farthings?
Ans. 334800 qrs.

2. Troy Weight.

6. Reduce 149 lb. to grains.

149
12
1788=ounces.
20
35760=pennyweights.
24
143040
71520
858240=grs. Ans. 858240 grs.

7. In 39 11 12 14 grs. how many grains?
Ans. 230222 grs.

8. How many grains are in a silver tankard, weighing 11 lbs.? Ans. 63360 grs.

3. Avoirdupois Weight.

9. Reduce 49 cwt. to ounces.

49
4
196=qrs.
28
1568
392
5488=lb.
16
32928
5488
87808=oz. Ans. 87808 oz.

10. In 39 2 14 8 4 drs. how many drams?
Ans. 1136260 drs.

11. In 12 14 3 qrs. how many pounds?
Ans. 28532 lb.

12. Reduce 8 tons to ounces. Ans. 286720 oz.

13. How many pounds are in 30 hogsheads of sugar, each weighing 9½ cwt.? Ans. 31920 lb.

4. Apothecaries' Weight.

14. In 27 11 7 1 18 grs. how many grains?

12

335=ounces.
8

2687=drams.
3

8062=scruples.
20

161258=grains. Ans. 161258 grs.

15. Reduce 34 lb. 10 ℥. to drams. Ans. 3344 drs.

5. Long Measure.

16. In 100 miles, how many feet?

100
8

800=furlongs.
40

32000=rods.
5½

160000
16000

176000=yards.
3

528000 Ans. 528000 ft.

17. In 84 miles, how many inches? Ans. 5322240 in.

18. In 15 7 30 2 feet, how many inches?
Ans. 1011876 in.

19. How many rods in a mile? Ans. 320 rods.

20. In 100 leagues, how many yards?
Ans. 528000 yds.

21. How many yards from Boston to Salem, the distance being 18 miles? Ans. 31680 yds.

22. How many barley-corns will reach round the world?
Ans. 410572800C bar.

23. How many inches from Boston to London, allowing the distance 3000 miles? Ans. 190080000 in.

6. Cloth Measure.

24. In 84 yards, how many nails? Ans. 1344 n.

25. Reduce 124 3 3 nails to nails. Ans. 1999 n.

26. In 25 pieces of cloth, each piece 20 yards, how many yards, quarters and nails? Ans. 500 yds. 2000 qrs. 8000 n.

7. Time.

27. How many hours in 40 years? Ans. 350400 h.

28. In 29 11 3 6 23 hours, how many seconds?
Ans. 870908400 sec.

29. How many minutes since the birth of our Saviour, the present year being 1818? Ans. 955540800 m.

N. B. 1. *To reduce Longitude into Time.*

Rule. Multiply the Longitude by 4, observing that miles produce seconds, and degrees minutes; or divide the longitude by 15, the degrees equal to an hour.

Examples.

30. The Longitude of Boston is 70° 37′; what is the difference of time between it and London?

70 37
4

4 42 28 seconds, Ans. Or, 70 37÷4 42 28 se.

2. *To change Time into Longitude.*

Rule. Multiply the time by 10, adding one half of the product to itself.

Examples.

31. In 4 42 28 seconds, how many degrees of Longitude?

4 42 28
10

½)47 04 40
23 32 20

70 37 00 Ans. 70° 37′.

8. Land, or Square Measure.

32. In 44 acres, how many perches? Ans. 7040 per.
33. In 49 2 18 poles, how many poles? Ans. 7938 pol.
34. In 34 acres, how many roods and rods? Ans. { 136 roods. / 5440 rods.

9. Solid Measure.

35. In 12 tons of round timber, how many cubic inches? Ans. 829440 in.
36. How many solid or cubic inches in 12 tons of hewn timber? Ans. 1036800 in.
37. How many solid inches in a cord of wood? Ans. 221184 in.

10. Wine Measure.

38. How many gallons and pints in 5 tuns of wine? Ans. { 1260 gal. / 10080 pts.
39. Reduce 5 pipes to pints. Ans. 5040 pts.

11. Dry Measure.

40. In 30 chaldrons of coal, how many bushels? Ans. 960 bush.
41. Reduce 24 bushels to pints. Ans. 1536 pts.
42. In 20 chaldrons, how many bushels, London measure? Ans. 720 bush.

REDUCTION ASCENDING.

Reduction Ascending teaches to bring a less denomination into a greater.

Rule. Divide the lowest denomination given by so many of that name as make one of the next higher; and thus continue to do till the number is brought into the denomination required.

Proof. As Reduction Ascending is performed by division, it is proved by multiplication; that is, by changing the order of the question, and multiplying the last quotient by the last divisor, adding the remainders, if any.

Examples.

1. Money.

1. In 752640 farthings, how many pounds?

4)752640=farthings.

12)188160=pence.

2,0)1568,0=shillings.

784=pounds.

Proof £784=last quotient.
20=last divisor.

15680=shillings.
12

188160=pence.
4

752640=farthings as above.

Note. When there are remainders after dividing, they are always of the same name with their respective dividends, and must be placed after the last quotient, according to the order of their names, the highest denomination first; the several mixt numbers, thus formed, will be the answer.

2. In 331122 farthings, how many pounds?

4)331122

12)82780 ½ qrs. rem.

2,0)689,8 4 d. rem.

£344 18 4½ Ans. £344 18 4½.

3. In 700 shillings, how many pounds? Ans. £35.
4. In 11760 pence, how many guineas? Ans. 35 guin.
5. Bring 334690 farthings into pounds. Ans. £348 12 8½.

2. Troy Weight.

6. In 858240 grains, how many pounds?

2,0
24)858240(3576,0
72
138
120
182
168
144
144
0

12)1788
149 lb.

Ans. 149 lb.

7. In 230222 grains, how many pounds?
Ans. 39 11 12 14 grs.

8. How many pounds will a tankard weigh, which contains 63360 grains? Ans. 11 lb.

3. Avoirdupois Weight.

9. Reduce 159488 ounces to cwt.

(28) (4)
16)159488(9968(356
144 84 —
— — 89 cwt.
154 156
144 140
— —
108 168
96 168
— —
128 0
128
—
0

Ans. 89 cwt.

10. In 1136260 drams, how many cwt.?
Ans. 39 2 14 8 4 drs.

11. How many tons in 28532 pounds?
Ans. 12 14 3 qrs.

12. Bring 286720 ounces to tons. Ans. 8 tons.

13. How many hogsheads, weighing 9½ each, are in 31920? Ans. 30 hhds.

4. Apothecaries' Weight.

14. Reduce 161258 grains to pounds.

2,0)16125,8
—
3)8062 18
—
8)2687 1
—
12)335 7
—
27 11 7 1 18 grs. Ans. 27 11 7 1 18 grs.

15. Reduce 3344 drams to pounds? Ans. 34 10 drs.

5. Long Measure.

16. In 528000 feet, how many miles?

3)528000=feet.

5½)176000=yards.

4,0)3200,0=rods.

8)800=furlongs.

100=miles. Ans. 100 m.

17. In 5322240 inches, how many miles? Ans. 84 m.

18. In 1011876 inches, how many miles?
Ans. 15 7 30 2 2 ft.

19. How many miles in 320 rods? Ans. 1 m.

20. In 528000 yards, how many leagues? Ans. 100 leag.

21. If 31680 yards will reach from Salem to Boston, how many miles? Ans. 18 m.

22. If 4105728000 barley-corns will reach round the globe, how many degrees? Ans. 360°.

23. Suppose that 190080000 inches would reach from Boston to London, how many miles? Ans. 3000 m.

6. Cloth Measure.

24. In 1344 nails, how many yards? Ans. 84 yds.

25. Reduce 1999 nails to yards? Ans. 124 3 3 n.

26. Reduce 8000 nails to quarters and yards. Ans. { 2000 qrs. / 500 yds.

7. Time.

27. How many years in 350400 hours? Ans. 40 yrs.

28. In 870908400 seconds, how many years?
Ans. 29 11 3 6 23 h.

29. In 955540800 minutes, how many years?
Ans. 1818 yrs.

8. Land, or Square Measure.

30. Reduce 7040 rods to acres? Ans. 44 acres.

31. In 7938 poles, how many acres? Ans. 49 2 18 pol.

32. How many acres in 136 roods? Ans. 34 acres.

33. How many acres in 5440 rods? Ans. 34 acres.

9. Solid Measure.

34. How many tons of round timber in 829440 solid, or cubic inches? Ans. 12 tons.

35. In 221184 solid inches, how many cords?
Ans. 1 cord.

10. Wine Measure.

36. Reduce 1260 gallons to tuns. Ans. 5 tuns.

37. How many pipes in 5040 pints? Ans. 5 pipes.

11. Dry Measure.

38. In 960 bushels, how many chaldrons? Ans. 30 ch.

39. Reduce 1536 pints to bushels. Ans. 24 bush.

40. In 720 bushels, how many London chaldrons?
Ans. 20 ch.

REDUCTION ASCENDING AND DESCENDING

Is exchanging numbers from a greater to a less, and from a less to a greater denomination, as the nature of the question may be, and is performed by multiplication and division.

Examples.

1. Money.

1. How many shillings, crowns and pounds are in 80 guineas? Ans. 2240 shillings. 336 crowns. 112 pounds.

2. In £84, how many pence, three pences, groats and moidores? Ans. 20160 d. 6720 three pences. 5040 groats. $46\frac{2}{3}$ moidores.

3. A person had 20 purses, in each purse 18 guineas, 8 pounds, a crown, and a moidore; how many pounds sterling had he? Ans. £530.

2. Troy Weight.

4. In 29 8 12 19 grains Troy, how many pounds Avoirdupois? Ans. 24 7 $4\frac{3872}{7000}$

5. How many rings, each weighing 6 8 grs. may be made of 4 6 13 pwt. of gold?
Ans. 172 rings, and 3, 16 grs. over.

6. A gentleman sent a tankard to his goldsmith, which weighed 84 12 pwts. directing him to make it into spoons of 3 6 pwts. each? how many had he?

Ans. 25 spoons and 2, 2 pwt. over.

7. A gentleman sent his goldsmith 11 5 6 9 grains of silver, and directed him to make it into tankards of 1 5 15 10 grains each; spoons of 1 9 11 13 grains per doz. salts of 3 10 pwt. each; and forks of 1 9 11 13 grains per doz.; and for every tankard to have one salt, a dozen of spoons, and a dozen of forks; what number of each must he have? Ans. 2 of each sort, and 8 9 9 grs. over.

3. Avoirdupois Weight.

8. In 34 pounds Avoirdupois,* how many pounds Troy?

Ans. 41 3 16 16 grs.

9. How many parcels of sugar, of 14 pounds each, are in a hogshead which weighs 18 1 14 pounds?

Ans. 147 of 14 lb. each.

4. Long Measure.

10. How many times the length of a ship's keel will reach from Boston to the Land's End, in England, a direct course being about 2500 miles, and the ship's keel 110½ feet in length? Ans. 119187$\frac{11}{11}$$\frac{2}{3}$.

11. How many times will the wheel of a chaise turn in running from Boston to Salem, the distance being 18 miles, and the circumference of the wheel 15½ feet?

Ans. 6131$\frac{11}{31}$

12. How many steps, of 2 6 inches each, must a person take in walking from Boston to Cambridge Common, the distance being 3¼ miles? Ans. 6864.

COMPOUND ADDITION.

Compound Addition is the collecting of several numbers of different denominations into one sum; as pounds, shillings; hundreds, quarters, &c.

Rule. 1. Place the numbers of the same denomination under each other.

* 7000 grs.=1 lb. Avoirdupois, and 5760 grs.= 1lb. Troy.

2. Add the figures in the lowest denomination, as in Simple Addition.

3. Divide this sum by as many of the same name as make one of the next higher denomination, as in Reduction Ascending.

4. Set the remainder under the denomination added, and carry the quotient to the next higher denomination; continue so to do to the highest denomination, which add, as in Simple Addition.

NOTE. This rule is applicable to all sums in Compound Addition of money, weights and measures.

PROOF. Cut off the upper line of numbers by drawing a line below it; add the rest of the numbers, and set them down as in the operation; then add the last found number and upper line together, their sum will be the same as the first addition.

EXAMPLES.

1. MONEY.

£.	s.	d.	qrs.
874	17	10	½
387	14	11	½
87	8	9	¾
134	3	8	½
£1484	5	4	¼ Sum.
609	7	5	¾
1484	5	4	¼ Proof.

£.	s.	d.	qrs.
487	12	8	¼
389	18	10	½
78	19	11	½
874	13	8	¾
£1831	5	3	

NOTE. ¼=1 farthing, or a quarter of any thing.
½=2 farthings, or half of any thing.
¾=3 farthings or three quarters of any thing.

2. TROY WEIGHT.

lb.	oz.	pwt.	grs.
487	11	18	23
787	8	14	19
487	9	16	14
736	10	18	12
2500	5	8	20

lb.	oz.	pwt.	grs.
983	8	14	13
487	7	15	12
787	10	18	15
148	9	17	13
2408	1	6	5

lb.	oz.	pwt.
874	11	14
987	8	13
787	10	12
187	10	16
2838	5	15

3. Avoirdupois Weight.

cwt.	*qrs.*	*lb.*	*oz.*	*drs.*
345	2	19	13	13
749	3	17	14	12
300	1	8	14	14
748	2	14	11	12
2144	2	5	7	3

cwt.	*qrs.*	*lb.*	*oz.*	*drs.*
487	1	18	12	12
373	2	17	13	14
748	3	14	14	15
874	2	18	13	11
2484	2	14	7	4

4. Apothecaries' Weight.

lb.	*oun.*	*drs.*	*scru.*
487	11	6	2
787	8	5	1
900	7	3	2
709	11	7	2
2886	3	7	1

lb.	*oun.*	*drs.*	*scru.*	*grs.*
874	10	6	2	18
987	9	4	1	19
387	7	3	2	17
487	3	2	1	14
2737	7	2	0	8

5. Long Measure.

miles.	*fur.*	*pol.*	*yds.*
874	6	36	$4\frac{1}{2}$
973	4	26	$3\frac{3}{4}$
187	6	14	$1\frac{1}{2}$
874	7	18	$3\frac{3}{4}$
2911	1	16	$2\frac{1}{2}$

miles.	*fur.*	*pol.*	*yds.*	*feet.*	*in.*	*bar.*
874	4	28	$3\frac{1}{2}$	2	11	2
389	5	18	$1\frac{2}{4}$	1	8	1
187	3	17	$4\frac{3}{4}$	2	7	2
874	1	14	$1\frac{1}{4}$	1	10	1
2325	6	39	$3\frac{1}{4}$	0	2	0

6. Cloth Measure.

yds.	*qrs.*	*n.*
487	3	2
878	1	2
983	2	1
756	3	2
3106	2	3

E.E.	*qrs.*	*n.*
834	4	2
739	3	1
487	2	2
578	3	1
2640	3	2

Fl.E.	*qrs.*	*n.*
824	2	2
347	2	1
678	1	2
487	2	1
2338	2	2

Fr.E.	*qrs.*	*n.*
879	5	2
654	4	2
783	1	1
874	3	2
3192	2	3

7. TIME.

years.	*mo.*	*w.*	*d.*	*h.*
874	11	3	6	23
784	8	1	5	19
130	7	1	4	12
898	6	2	1	15
2688	10	1	4	21

years.	*mo.*	*w.*	*d.*	*h.*	*m.*
837	8	3	5	18	38
478	9	2	6	22	39
748	11	3	5	13	24
874	8	1	6	14	13
2940	3	0	3	20	54

8. MOTION.

Signs.	*deg.*	*m.*	*sec.*
9	22	35	44
10	13	19	18
8	13	23	38
11	28	44	46
40	18	3	26

deg.	*m.*	*sec.*
18	34	14
17	36	38
18	14	17
24	39	48
79	4	57

deg.	*m.*	*sec.*
14	25	18
18	48	13
12	13	18
11	16	15
56	43	4

COMPOUND SUBTRACTION.

COMPOUND SUBTRACTION teaches to find the difference between two numbers of different denominations.

RULE. 1. Subtract the under numbers from the upper, and set their difference under their respective denominations.

2. If the under number of any of the denominations is greater than the upper, take it from as many as make one of the next higher denomination; add the difference to the upper number, and set down their sum, remembering to carry *one* to the next higher denomination, before subtracting it.

EXAMPLES.

1. MONEY.

1.

£.	*s.*	*d.*	*qrs.*	
8745	10	11	½	Minuend.
189	8	3	¼	Subtrahend.
8556	2	8	¼	

2.

£.	*s.*	*d.*	*qrs.*
483	13	10	¼
90	17	11	¾
392	15	10	½

2. Troy Weight.

3.

lb.	oz.	pwt.	grs.
387	10	13	13
187	11	18	19
199	10	14	18

4.

lb.	oz.	pwt.
784	8	15
387	11	14
396	9	1

5.

lb.	oz.	pwt.	grs.
898	7	14	14
187	10	15	18
710	8	18	20

3. Avoirdupois Weight.

6.

cwt.	qrs.	lb.	oz.	drs.
437	2	19	13	12
89	3	24	13	14
347	2	22	15	14

7.

cwt.	qrs.	lb.	oz.	drs.
874	2	14	13	13
87	3	27	14	15
786	2	14	14	14

4. Apothecaries' Weight.

8.

lb.	oun.	drs.	scru.	grs.
348	10	3	2	12
89	11	5	2	15
258	10	5	2	17

9.

lb.	oun.	drs.
874	8	4
99	10	7
774	9	5

10.

lb.	oun.	scru.	grs.
434	10	3	2
379	11	6	2
54	10	5	0

5. Long Measure.

11.

miles.	fur.	pol.	yds.	ft.
387	5	27	$2\frac{1}{2}$	1
93	6	36	$4\frac{3}{4}$	2
293	6	30	3	2

12.

miles.	fur.	pol.	yds.	ft.	in.
834	3	25	$4\frac{1}{2}$	1	10
87	4	29	$3\frac{3}{4}$	2	11
746	6	35	$5\frac{1}{4}$	1	11

6. Cloth Measure.

13.

yds.	qrs.	n.
431	2	1
139	3	3
291	2	2

14.

E.Eng.	qrs.	n.
834	4	2
89	4	3
744	4	3

15.

E.Fl.	qrs.	n.
874	2	1
89	2	3
784	2	2

16.

E.Fr.	qrs.	n.
874	5	1
87	5	2
786	5	3

7. TIME.

17.							18.					
yrs.	*mo.*	*w.*	*d.*	*h.*	*m.*	*sec.*	*yrs.*	*mo.*	*w.*	*d.*	*h.*	*m.*
987	11	2	4	14	13	18	8748	8	1	2	22	14
374	11	3	5	16	46	55	87	11	3	4	23	56
612	11	2	5	21	26	23	8660	8	1	4	22	18

8. WINE MEASURE.

19.				20.			21.		
hhd.	*gal.*	*qrt.*	*pt.*	*tier.*	*gal.*	*qrt.*	*tun.*	*hhd.*	*gal.*
834	11	2	1	38	11	1	834	1	18
87	25	3	1	18	24	2	89	2	28
746	48	3	0	19	28	3	744	2	53

QUESTIONS.

1. From £1 take ¼ qrs. Ans. 19 11½ qrs.
2. From 1 lb. Troy, take 1 grain. Ans. 11 19 23 grs.
3. From 1 cwt. take 1 oz. Ans. 3 27 15 oz.
4. From a mile take an inch. Ans. 7 39 4½ 2 11 in.
5. From a year take a second.

Ans. 364 23 59 59 sec.

5. Take one second from the Christian era, allowing even years, and 365 days for a year.

Ans. 1817 364 23 59 59.

COMPOUND MULTIPLICATION.

COMPOUND MULTIPLICATION is the multiplying of sums of different denominations.

RULE. Multiply the lowest denomination by the given multiplier, and divide the product by as many as make one of the next higher denomination; set down the remainder, and add the quotient to the next higher denomination, after it is multiplied.

PROOF. By Division.

Examples.

1. Money.

1.

	£.	s.	d.	qrs.
Multiply	874	10	6	½
by				8
Product.	6996	4	4	

2.

	£.	s.	d.	qrs.
	8348	18	11	¾
				12
	100187	7	9	

2. Troy Weight.

3.

	lb.	oz.	pwt.	grs.
Multiply	874	10	12	11
by				9
	7873	11	12	3

4.

	lb.	oz.	pwt.	grs.	
	343	8	8	3	by 24.
				4×6	
	8248	9	15	0	

3. Avoirdupois Weight.

5.

	cwt.	qrs.	lb.	oz.
Multiply	28	2	14	12
by				11
	314	3	22	4

6.

	cwt.	qrs.	lb.	oz.	
	37	3	18	2	by 16.
				4×4	
	606	2	10	0	

4. Apothecaries' Weight.

7.

	lb.	oun.	drs.	scru.
Multiply	18	11	5	2
by				8
	151	9	5	1

8.

	lb.	oun.	drs.	scru.	
	804	8	3	2	by 30.
				6×6	
	28969	4	4	0	

5. Long Measure.

9.

	miles.	fur.	pol.	yds.
Multiply	34	3	10	4½
by				7
	240	6	35	4

10.

	miles.	fur.	pol.	yds.
	80	7	34	3
				10
	809	6	25	2½

6. TIME.

	11.				12.						
Multiply by	34	11	2	3	12	87	10	3	2	12	10	18	12
	419	7	2	0	0	1054	10	0	2	2	3	36	

Compound Multiplication is an useful and concise rule for finding the value of goods. It is a contraction of the Rule of Three, when the first number is an unit.

GENERAL RULE.

Multiply the price by the quantity.

CASE. I.

When the quantity is not more than 12.

RULE. **Multiply the price by the whole quantity, and the product will be the answer.**

EXAMPLES.

1. What will 8 yards of cloth cost at £3 12 6½ per yard?

£3	12	6½
		8
£29	0	4

Ans. £ 29 0 4.

2. What will 12 lb. of tea cost at £0 13 8½ per pound?

Ans. £8 4 6.

CASE II.

When the quantity is more than 12, and a composite number, that is, such that two figures will make it when multiplied together.

RULE. **Find two figures which will make the quantity when multiplied together, and multiply the price by these figures, the last product will be the answer.**

Examples.

3. What will 24 yards cost at £4 10 8½ per yard?

4×6=24. £4 10 8½=price.
4 yards.

18 2 10=value of 4 yards.
6 yards.

£108 17 6 = value of 24 yards.

Ans. £108 17 6.

4. What will 132 yards cost at £3 0 8½ per yard?

Ans. £400 10 9.

Case III.

When the quantity is such that no figures in the table will make it.

Rule. Multiply by two such figures that will come the nearest to it, and add the price of the odd quantity, if less, but subtract it, if greater.

Examples.

5. What will 29 lb. cost, at £2 8 4½ per lb.?

4×7=28 nearest. £2 8 4½=price.
1 odd. 4 lbs.

29 lb.

9 13 6 =value of 4 lbs.
7

67 14 6 =value of 28 lbs.
2 8 4½ = { value of 1 lb. added, because less.

70 2 10½=value 29 lbs.

Ans. £70 2 10½.

6. What will 127 yards cost at £8 0 0¾.

Ans. £1016 7 11¼.

Case IV.

To find the value of a hundred weight.

Rule. Multiply the price by 7, its product by 8, and this product by 2, the last will be the answer.

Examples.

7. What will 1 cwt. cost at £3 10 4½ per lb.?

	3	10	4½
			7
24	12		7½ = value of 7 lb.
			8
197	1	0	= value of 56 lb.
			2
£394	2	0	= value of 1 cwt. or 112 lb.

Ans. £394 2.

8. What costs 1 cwt. at £3 0 8¾ per lb.?

Ans. £340 1 8.

Case V.

To find the value of two or more hundreds.

Rule. First find the value of one hundred weight, (by Case IV.) then multiply the price of one hundred weight by the given number of hundreds.

Examples.

9. What will 12 cwt. cost at £3 8 4½ per lb.?

	3	8	4½
			7
23	18		7½ = value of 7 lb.
			8
191	9	0	= value 56 lb.
			2
382	18	0	= value 1 cwt.
		12	= given hundreds.
£4594	16	0	= 12 cwt.

Ans. £4594 16.

10. What will 87 cwt. cost at £1 13 4½ per lb?

Ans. £16260 6.

Case VI.

When there is a fractional part in the quantity.

Rule. 1. Find the value of the whole numbers by the preceding rules, according to the question.

2. Multiply the price by the numerator, and divide the product by the denominator; the quotient will be the value of the fraction, which, added together, will be the value of the whole quantity. (See Case VII. in Simple Division.)

Examples.

11. What will $8\frac{1}{2}$ yards cost at £3 2 $6\frac{1}{2}$ per yard?

$\frac{1}{4})3 \quad 2 \quad 6\frac{1}{2}$
$\quad\quad\quad 8$

25	0	4	=value of 8 yards.
1	11	$3\frac{1}{4}$	=value $\frac{1}{2}$ yard.
£26	11	$7\frac{1}{4}$	=value $8\frac{1}{2}$ yards.

Ans. £26 11 $7\frac{1}{4}$.

12. What will $144\frac{3}{8}$ yards cost at £2 18 $3\frac{1}{2}$ per yard?

Ans. £420 15 $10\frac{1}{4}+\frac{1}{4}$.

COMPOUND DIVISION.

Compound Division is the dividing of sums of different denominations.

Rule. Divide the highest denomination by the given number, and if any thing remains, reduce it to the next lower denomination, by multiplying it by as many of the next less as make one of that name, adding to the product, the number, if any, in the next lower denomination, and divide as before, setting each quotient under its respective denomination.

Proof. By Multiplication.

Examples.

1. Money.

	1.				2.			
Divide	£384	18	4	by 8.	£387	13	$4\frac{1}{2}$	by 12.
	8)384	18	4		12)387	13	$4\frac{1}{2}$	
	£48	2	$3\frac{1}{2}$	Ans.	£32	6	$1\frac{1}{4}$	Ans.

2. Troy Weight.

3.

	lb.	*oz.*	*pwt.*	*grs.*	
Divide	9	11	13	14	by 8.
8)	9	11	13	14	
	1	2	19	4+6	

4.

	lb.	*oz.*	*pwt.*	*grs.*	
	18	8	12	13	by 12.
12)	18	8	12	13	
	1	6	14	9+1	

3. Avoirdupois Weight.

5.

	cwt.	*qrs.*	*lb.*	
Divide 8)	84	2	18	by 8.
	10	2	9	4

6.

	cwt.	*qrs.*	*lb.*	*oz.*	*drs.*	
11)	874	3	27	13	13	by 11.
	79	2	5	1	4+1	

4. Apothecaries' Weight.

7.

	lb.	*ou.*	*drs.*	*scr.*	
Divide 7)	134	9	3	2	by 7.
	19	3	0	1	11+3

8.

	lb.	*ou.*	*drs.*	*scr.*	*grs.*	
8)	874	10	5	2	14	by 8.
	109	4	2	2	4+2	

5. Long Measure.

9.

	miles.	*fur.*	*pol.*	*yds.*	*ft.*		
Divide 12)	384	6	24	3	2	by 12.	
	32	0	22	0	0	11	in.

10.

	miles.	*fur.*	*pol.*	*yds.*	*ft.*		
9)	874	7	34	3	2	by 9.	
	97	1	30	2	2	6	2

6. Time.

11.

	yrs.	*mo.*	*w.*	*d.*	*h.*	*m.*	*sec.*	
Divide 11)	874	11	2	3	18	43	24	
	79	6	2	0	8	14	51+3	

12.

	yrs.	*mo,*	*w.*	*d.*	*h.*		
9)	874	11	1	4	22		
	97	2	2	2	21	6	40

Compound Division is useful in finding the value of 1 lb. 1 yard, &c. having the value and the quantity given.

It is a contraction of the Rule of Three, when the third term is an unit.

General Rule.

Divide the price by the quantity, and the quotient will be the answer.

Case I.

When the quantity does not exceed 12.

Rule. Divide the price by the whole quantity.

Examples.

1. If 8 yards cost £29 0 4, what will 1 yard cost?

8)29 0 4

£3 12 6½ Ans. £3 12 6½.

2. If 12 lb. cost £8 4 6, what will 1 lb. cost?

Ans. £0 13 8½.

Case II.

When the quantity is more than 12, and such a number that two or more figures will make it, when multiplied together.

Rule. Divide the price by these figures, and the last quotient will be the answer.

Examples.

3. If 24 yards cost £108 17, what will 1 yard cost?

4×6=24. 4)108 17

6)27 4 3

£4 10 8½ Ans. £4 10 8½.

4. If 132 lb. cost £400 10 9, what will 1 lb. cost?

Ans. £3 0 8½.

Case III.

When the quantity is such that no two figures in the Table will make it.

Rule. Divide the whole price by the whole quantity, as in Long Division.

Examples.

5. If 29 yards cost £70 2 10½, what will 1 yard cost?

29)70 2 10½ (2 8 4½ Ans.
58
12
20
29)242
232
10
12
29)130
116
14
4
29)58
58
0

Ans. £2 8 4½.

6. If 127 yards cost £1016 7 11¼, what will 1 yard cost? Ans. £8 0 0¾.

Case IV.

When the quantity is one hundred weight, to find the value of 1 lb.

Rule. Divide the price by 8, its quotient by 7, and this quotient by 2, the last quotient will be the answer.

Examples.

7. If one hundred weight cost £394 2 what will one pound cost?

8)394 2

7)49 5 3

2)7 0 9

£3 10 4½ Ans. £3 10 4½.

8. If one hundred weight cost £340 1 8, what will one pound cost? Ans. £3 0 8¾.

Case V.

When the quantity is two or more hundreds to find the price of one pound.

Rule. Divide the given price by the given number of hundreds, the quotient will be the price of one hundred weight, then divide by 8, 7 and 2, the last quotient will be the price of one pound.

Examples.

9. If 12 cwt. cost £4594 16, what will 1 lb. cost?

12)4594 16

8)382 18

7)47 18 3

2)6 16 9

£3 8 4½ Ans. £3 8 4½.

10. If 87 cwt. cost £16260 6, what will 1 lb. cost?
Ans. £1 13 4½.

Case VI.

When there is a fractional part in the quantity.

Rule. Multiply the integer of the given quantity by the denominator of the fraction, and to the product add the numerator, for a divisor; multiply the given price by the denominator, and divide by the new divisor, the quotient will be the answer. (See Case VI. in Simple Division.)

EXAMPLES.

11. If $8\frac{1}{2}$ yards cost £26 11 $7\frac{1}{4}$, what will 1 yard cost?

$8\frac{1}{2}$ | 26 11 $7\frac{1}{4}$
2 | 2
$17=\frac{17}{2}$. | 17)53 3 $2\frac{1}{2}$(3 2 $6\frac{1}{2}$
51
2
20
17)43
34
9
12
17)110
102
8
4
17)34
34
0

Ans. £3 2 $6\frac{1}{2}$.

12. If $144\frac{3}{4}$ yards cost £420 15 $10\frac{1}{4}+\frac{1}{4}$, what will 1 yard cost? Ans. £2 18 $3\frac{1}{2}$.

VULGAR FRACTIONS.

1. A FRACTION is a part, or parts, of an unit.

2. A fraction is written with two numbers, placed one above the other, with a line drawn between them; as $\frac{2}{3}$.

3. The number above the line is called the numerator.

4. The number below the line is called the denominator.

$\frac{2}{3}$

5. The denominator shows into how many parts the unit is divided, and the numerator how many of these parts are expressed, or meant by the fraction.

6. A fraction has its origin from Division, the numerator being the remainder, and the denominator the divisor. (See Note in Simple Division, page 18.)

7. The numerator of a fraction is to be considered as a *dividend*, and the denominator as a *divisor*, and the fraction as an expression of the *quotient*, arising from the division of the numerator by the denominator. Hence,

8. A fraction is less, equal, or greater than an unit, as the numerator is less, equal, or greater than the denominator.

9. The nature of a fraction may be illustrated by the following example. Let 11 be divided by 3.

$$3\overline{)11}$$

$$3\tfrac{2}{3}$$

The quotient is three whole units, the remainder signifies that the 2 is divided by 3, and that the quotient is $\frac{2}{3}$ of an unit.

10. A vulgar fraction is that which can have any denominator, and may be either proper, improper, compound, or mixt.

11. A proper, single, or simple fraction is that whose numerator is less than its denominator; as $\frac{1}{4}$.

12. An improper fraction is that whose numerator is greater than its denominator; as $\frac{5}{4}$.

13. A compound fraction is a fraction of a fraction, and is connected by the word *of;* as $\frac{3}{4}$ of $\frac{1}{7}$ of $\frac{1}{2}$.

14. A mixt number, or fraction, is composed of a whole number and a fraction; as $5\frac{1}{2}$.

15. The value of a fraction depends on the proportion which the numerator has to the denominator; therefore the same fraction may be expressed by many different numbers; as $\frac{50}{100}$, $\frac{36}{72}$, $\frac{24}{48}$, $\frac{12}{24}$, $\frac{6}{12}$, $\frac{3}{6}$, $\frac{1}{2}$ are all equal fractions, each being equal to one half of an unit.

16. When the numerator and denominator are alike, the fraction is equal to 1.

17. A fraction whose numerator is greater than its denominator, is equal to some whole, or mixt number; as $\frac{7}{4}=1\frac{3}{4}$.

18. A whole number may be expressed fractionally by placing 1 under it; as $\frac{4}{1}$=to 4.

NOTE. As fractions can neither be added, subtracted, multiplied, nor divided, before they change their forms by Reduction, it is necessary that this rule should be explained before Addition.

REDUCTION OF VULGAR FRACTIONS.

Reduction of fractions teaches to bring them from one form into another, to prepare them for the operations of Addition, Subtraction, Multiplication and Division.

Problem I.

To find the greatest common measure of any two numbers.

Rule. Divide the greater number by the less, and the last divisor by the remainder, till nothing remains; the last divisor will be the greatest common measure.

Note. A number which can divide several numbers exactly, is called their *common measure*.

Examples.

1. To find the greatest common measure of 48 and 256.

```
48)256(5
   240
   ---
   16)48(3
      48
      --
       0
```

16 being the last divisor, is the greatest common measure. Ans. 16.

2. Find the greatest common measure of 216 and 768. Ans. 24.

Problem II.

To find the greatest common measure of three or more numbers.

Rule. Find the greatest common measure of the two least given numbers; then find the common measure of this measure, and the next greater of the given numbers, and again of *this last measure*, and the next greater, and so on till all the given numbers are used.

Examples.

3. Find the greatest common measure of 48, 80, and 136.

80÷48=16 and 136÷16=8=greatest common measure. Ans. 8.

4. What is the greatest common measure of 216, 270, and 405. Ans. 27.

Problem III.

To find the least common multiple of several numbers.

RULE. Set the numbers in a line, and divide them by any number which will divide *two or more* of them without a remainder; place the quotients and the undivided numbers in a line under them; divide them continually as before, until it appears that no two can be divided; the continual product of all the undivided numbers, and the several divisors, will be the least common multiple required.

NOTE. A common multiple is a number which can be divided by two or more numbers.

EXAMPLES.

5. What is the least common multiple of 2, 3, 6, 9, 12, and 15?

3)2 3 6 9 12 15

2)2 1 2 3 4 5

1 1 1 3 2 5 $1\times2\times3\times2\times3=180$. Ans. 180.

6. What is the least common multiple of the nine digits? Ans. 2520.

CASE I.

To reduce fractions to their lowest terms.

RULE. Divide the numerator and denominator of the given fraction by any number which will divide them without a remainder, and so on till there is no number greater than an unit, which will divide them. Or divide the numerator and denominator by their greatest common measure, and the quotients will form the fraction in its lowest terms.

NOTE. If the common measure happens to be 1, the fraction is in its lowest terms.

EXAMPLES.

7. Reduce $\frac{96}{544}$ to its lowest terms.

Or 96)544(5
480 com. meas. $32)\frac{96}{544}=\frac{3}{17}$ as before.

64)96(1
64

$8)\frac{96}{544}=\frac{12}{68}\div4=\frac{3}{17}$ Ans. 32(64(2
64

0

Ans. $\frac{3}{17}$.

8. Reduce $\frac{2544}{2912}$. to its lowest terms. Ans. $\frac{7}{8}$.
9. $\frac{55444}{147764}$. to its lowest terms. Ans. $\frac{3}{8}$.

Case II.

To reduce a mixt number to its equivalent improper fraction.

Rule. Multiply the whole number by the denominator of the given fraction, add the numerator to the product for a new numerator, which written over the denominator will form the fraction required.

Examples.

10. Reduce $12\frac{3}{8}$ to an improper fraction.

12
8 denominator.

96
3 numerator added. And 99 new num.

99 new numerator. 8 denom. Ans. $\frac{99}{8}$.

11. Reduce $120\frac{11}{14}$ to an improper fraction. Ans. $^{1}\frac{691}{14}$.

Case III.

To reduce an improper fraction to its equivalent whole or mixt number.

Rule. Divide the numerator by the denominator, the quotient will be the whole number, and the remainder, if any, placed over the given denominator will form the fractional part.

Examples.

12. Reduce $\frac{99}{8}$ to a whole or mixt number.

8)99

$12\frac{3}{8}$. Ans. $12\frac{3}{8}$.

13. Reduce $^{1}\frac{691}{14}$ to a whole or mixt number.

Ans. $120\frac{11}{14}$.

Case IV.

To reduce a whole number to a vulgar fraction, whose denominator shall be given.

Rule. Multiply the whole number by the given denominator for the numerator, which, placed over the given denominator, will form the fraction required.

Examples.

14. Reduce 3 to a fraction whose denominator shall be 4.
$3\times4=12$. And $\frac{12}{4}$=Ans.
15. Reduce 12 to a fraction whose denominator is 11.
Ans. $\frac{132}{11}$.

Case V.

To reduce a compound fraction to a simple one.

Rule. Multiply all the numerators continually together for a new numerator, and all the denominators for a new denominator of the simple fraction.

Examples.

16. Reduce $\frac{1}{2}$ of $\frac{3}{4}$ of $\frac{5}{8}$ to a simple fraction.
$1\times3\times5=15$ new numerator.
$2\times4\times8=64$ new denominator. And $\frac{15}{64}$=Ans. $\frac{15}{64}$.
17. Reduce $\frac{3}{8}$ of $\frac{4}{5}$ of 8 to a simple fraction. Ans. $2\frac{4}{5}$.

Case VI.

To reduce fractions of different denominators to fractions having a common denominator.

Rule. Multiply each numerator, taken separately, into all the denominators, except its own, for new numerators; then multiply all the denominators continually together for the common denominator.

Note. When there are integers, mixt numbers, or compound fractions, given in the question, they must first be reduced to their simple forms by their proper rules.

Examples.

18. Reduce $\frac{3}{4}$, $\frac{5}{8}$, and $\frac{6}{7}$ to fractions having a common denominator.
$3\times8\times7=168$
$5\times4\times7=140$ } new numerators.
$6\times8\times4=192$
$4\times8\times7=224$ common denominator.
And $\frac{168}{224}$ $\frac{140}{224}$ $\frac{192}{224}$=Ans.

19. Reduce $\frac{5}{6}$, $\frac{7}{8}$ of $\frac{3}{4}$, and $\frac{2}{3}$ to fractions having a common denominator. Ans. $\frac{480}{576}$, $\frac{378}{576}$, $\frac{384}{576}$.
20. Reduce $\frac{3}{4}$, $\frac{3}{5}$ and $7\frac{2}{5}$ to a common denominator.
Ans. $\frac{180}{100}$, $\frac{60}{100}$, $\frac{1136}{100}$.

21. Reduce $\frac{2}{3}$, $\frac{4}{5}$, $\frac{3}{7}$ of $\frac{8}{11}$, and $\frac{1}{3}$ of $14\frac{3}{4}$ to a common denominator. Ans. $\frac{1380}{3080}$, $\frac{2464}{3080}$, $\frac{1155}{3080}$, $\frac{1540}{3080}$.

Case VII.

To reduce any fractions to others, which shall have the least common denominator.

Rule. Find the least common multiple (by prob. 3d) of all the denominators of the given fractions, and it will be the common denominator required; divide the common denominator by the denominator of each fraction, and multiply the quotient by the numerator, the product will be the numerator of the fraction required.

Examples.

22. Reduce $\frac{3}{4}$, $\frac{5}{8}$, and $\frac{6}{7}$ to fractions having the least common denominator.

2)4 8 7=denominators.

2)2 4 7

1 2 7×2×2×2=56 least com. multiple.=to the least common denominator.

Then 56÷4×3=42 first numerator.
56÷8×5=35 second do.
56÷7×6=48 third do.
Whence, $\frac{42}{56}$, $\frac{35}{56}$, $\frac{48}{56}$. Ans.

23. Reduce $\frac{2}{5}$, $\frac{3}{4}$, $\frac{4}{5}$ and $\frac{5}{6}$ to fractions with the least common denominator. Ans. $\frac{48}{60}$, $\frac{45}{60}$, $\frac{48}{60}$, $\frac{50}{60}$.

Case VIII.

To reduce a given fraction to another equal to it, that shall have a given denominator.

Rule. Multiply the numerator by the given denominator, and divide the product by the former denominator; the quotient, written over the given denominator, will form the fraction required.

Examples.

24. Reduce $\frac{2}{3}$ to a fraction of the same value, whose denominator shall be 12.

2×12=24÷3=8, And $\frac{8}{12}$ Ans.

25. Reduce $\frac{5}{7}$ to a fraction of equal value, whose denominator is 9. Ans. $\frac{7\frac{1}{2}}{9}=\frac{15}{18}$.

Case IX.

To reduce a given fraction to another equal to it, that shall have a given denominator.

Rule. Multiply the denominator by the given numerator, and divide the product by the former numerator, the quotient, written under the given numerator, will form the fraction required.

Examples.

26. Reduce $\frac{3}{4}$ to a fraction of the same value whose numerator shall be 12.

$12\times3\div2=18$. And $\frac{12}{16}$. Ans.

27. Reduce $\frac{3}{4}$ to a fraction of the same value whose numerator shall be 15. Ans. $\frac{15}{20}$.

Case X.

To reduce fractions from a less denomination to a greater; retaining the same value.

Rule. Make the given fraction a compound one by comparing it between the denomination given and that to which it is to be reduced; then reduce this compound fraction to a simple one.

Examples.

28. Reduce $\frac{5}{7}$ of a farthing to the fraction of a pound.

$\frac{5}{7}$ of $\frac{1}{4}$ of $\frac{1}{12}$ of $\frac{1}{20}$; then $\left.\begin{matrix}5\times1\times1\times1=\\7\times4\times12\times20=\end{matrix}\right\}\frac{5}{6720}=\frac{1}{1344}$ Ans.

29. Reduce $\frac{1}{3}$ of a penny to the fraction of a pound.

Ans. $\frac{1}{300}$£.

30. Reduce $\frac{1}{5}$ of a pennyweight to the fraction of a pound Troy. Ans. $\frac{1}{5760}$lb.

31. Reduce $\frac{7}{8}$ of an ounce to the fraction of a cwt.

Ans. $\frac{1}{2048}$ cwt.

32. Reduce $\frac{3}{4}$ of an inch to the fraction of a mile.

Ans. $\frac{1}{14080}$ m.

33. Reduce $\frac{1}{4}$ of a nail to the fraction of a yard.

Ans. $\frac{1}{64}$ yd.

34. Reduce $\frac{1}{6}$ of a minute to the fraction of a year.

Ans. $\frac{1}{3153600}$ year.

Case XI.

To reduce fractions from a greater denomination to a less, retaining the same value.

Rule. Multiply the numerator of the given fraction by the parts contained in all the denominations between *it*, and *that*, to which it is to be reduced, for a new numerator, which, placed over the denominator of the given fraction, will form the fraction required.

Examples.

35. Reduce $\frac{1}{1344}$ of a pound to the fraction of a farthing.
$1\times20\times12\times4=\frac{960}{1344}$. Ans. $\frac{960}{1344}=\frac{5}{7}$ qrs.

36. Reduce $\frac{1}{360}$ of a pound to the fraction of a penny.
Ans. $\frac{4}{5}$d.

37. Reduce $\frac{1}{240}$ of a pound Troy to the fraction of a penyweight.
Ans. $\frac{1}{5}$ pwt.

38. Reduce $\frac{1}{2048}$ of a cwt. to the fraction of an ounce.
Ans. $\frac{7}{8}$ oz.

39. Reduce $\frac{1}{147840}$ of a mile to the fraction of an inch.
Ans. $\frac{3}{7}$ in.

40. Reduce $\frac{1}{64}$ of a yard to the fraction of a nail.
Ans. $\frac{1}{4}$ nail.

41. Reduce $\frac{1}{525600}$ of a year to the fraction of a minute.
Ans. $\frac{1}{5}$ min.

Case XII.

To reduce a mixt fraction to a simple one.

Rule. 1. When the numerator is a mixt number, reduce it to an improper fraction; then multiply the denominator of the fraction by the denominator of the fractional part for a new denominator.

Examples.

42. Reduce $\frac{36\frac{2}{3}}{48}$ to a single fraction.

$36\times3+2=110$ numerator.

$48\times3=$ 144 new denominator. And $\frac{110}{144}=\frac{55}{72}$ Ans.

2. When the denominator is a mixt number, reduce it as before, then multiply the numerator of the fraction by

the denominator of the fractional part for a new numerator.)

43. Reduce $\frac{47}{65\frac{1}{5}}$ to a simple fraction.

$65\times5+4=329$ denominator.
$47\times5=235$ new numerator. Ans. $\frac{235}{329}=\frac{5}{7}$ Ans.

Case XIII.

To reduce any mixt quantity of coins, weights or measure to the simple fraction of an integer.

Rule. Reduce the given number to the lowest denomination in it for the numerator, and the integer to the same denomination for the denominator of the fraction required.)

44. Reduce 18 s. 4½ d. to the fraction of a pound.

s.	d.		
18	4½	20	
12		12	
220		240	
4		4	And $\frac{882}{960}=\frac{147}{160}$£ Ans.
882 numerator.		960 denom.	

45. Reduce 8 7 pwt. to the fraction of a lb. Troy.
Ans. $\frac{167}{240}$ lb.

46. Reduce 3 14 12 7 drs. to the fraction of a cwt.
Ans. $\frac{25239}{28672}$ cwt.

47. Reduce 7 34 1 2 11 inches to the fraction of a mile.
Ans. $\frac{622433}{633600}$ mile.

48. Reduce 145 18 40 13$\frac{3}{7}$ seconds to the fraction of a year.
Ans. $\frac{4408324}{11037600}$ year.

Case XIV.

To find the value of a fraction.

Rule. Multiply the numerator of the given fraction by the parts contained in the next less denomination, and divide the product by the denominator, and thus continue to do till the fraction is reduced to the lowest denomination.

Examples.

49. What is the value of $\frac{4}{7}$ of a pound?

4
20

7)80(11 5/7d.
77

3
12

36
35

1

Ans. 11 5/7 d.

Questions.		*Answers.*
50.	What is the value of $\frac{4}{5}$ of a guinea?	12 5/5+1/5 qrs.
51.	. . . . . $\frac{11}{12}$ of a cwt?	3 18 10 10 2/3 drs.
52.	. . . . . $\frac{7}{8}$ of a mile?	6 8 4 2 8 in.
53.	. . . . . $\frac{7}{8}$ of a yard?	3 2 n.
54.	. . . . . $\frac{3}{5}$ hhd. of ale?	21 2 1/2 qrs.
55.	. . . . . $\frac{7}{8}$ of a year?	9 1 2 8 h.
56.	. . . . . $\frac{7}{8}$ of a month?	3 3 12 h.

ADDITION OF VULGAR FRACTIONS.

Rule. 1. Reduce compound fractions to simple ones; mixt numbers to improper fractions; fractions of different denominations to the same, and all of them to a common denominator.

2. Add all the numerators together, and place their sum over the common denominator.

Proof. Find the value of the given fractions severally and add them together; then find the value of the fraction making the answer; if they agree, the work is right.

Examples.

57. Add $\frac{3}{4}$ and $\frac{4}{5}$ together.

3×5=15
4×4=16

31=sum numerators. And $\frac{31}{20}=1\frac{11}{20}$. Ans.
4×5=20 denominator.

58. What is the sum of $\frac{5}{7}$, $3\frac{2}{5}$, and $\frac{1}{2}$ of $\frac{7}{8}$? Ans. $4\frac{3}{5}\frac{1}{6}\frac{2}{0}$.

59. Add $\frac{1}{3}$ of a £. $\frac{7}{11}$ of a *s.* and $\frac{1}{4}$ of a *d.* together.
Ans. $\frac{2}{7}\frac{4}{0}\frac{5}{4}$ £.

60. What is the sum of $\frac{1}{2}$ of a foot, $\frac{3}{4}$ yd. $\frac{1}{6}$ rod, $\frac{1}{5}$ fur. $\frac{7}{8}$ mile? Ans. $\frac{6}{7}\frac{9}{6}\frac{1}{8}\frac{9}{0}$=7 8 1 1 9 $2\frac{1}{4}$ barley-corns.

61. Add $\frac{1}{4}$ of a week, $\frac{1}{2}$ day, $\frac{3}{4}$ h. $\frac{1}{5}$ m. and $\frac{3}{8}$ sec. together.
Ans. $\frac{1}{8}\frac{7}{3}\frac{5}{7}\frac{2}{6}\frac{1}{0}\frac{1}{0}$=2 6 45 $12\frac{3}{8}$ seconds.

SUBTRACTION OF VULGAR FRACTIONS.

Rule. Prepare the fractions as in Addition, and the difference of the numerators, written over the common denominator, will form the fraction required.

Note 1. To subtract a fraction from a whole number, take the numerator from the denominator, and 1 from the whole number. Observe the same rule in mixt numbers, when they have a common denominator.

2. When the lower fraction is greater than the upper, subtract the numerator of the lower fraction from the denominator, and to the difference add the upper numerator, carrying 1 to the whole number.

Examples.

62. What is the difference between $\frac{5}{6}$ and $\frac{3}{8}$?

$5\times8=40$
$3\times6=18$

22=diff. of the numerators.
$6\times8=48$=common denominator. } Then $\frac{2}{4}\frac{2}{8}=\frac{1}{2}\frac{1}{4}$ Ans.

63. What is the difference between $9\frac{3}{5}$ and $\frac{2}{5}$ of $6\frac{1}{4}$?
Ans. $7\frac{1}{1}\frac{}{0}$.

64. What is the difference between $\frac{3}{8}$ of $6\frac{1}{2}$ £. and $\frac{7}{6}$ of a shilling? Ans. $2\frac{3}{7}\frac{8}{2}\frac{7}{0}$.

65. From $\frac{5}{6}$ of a cwt. take $\frac{7}{9}$ of an oz. Ans. $\frac{1}{2}\frac{9}{3}\frac{1}{0}\frac{9}{4}$.

66. What is the difference between $\frac{1}{3}$ yd. and $\frac{3}{6}$ of a mile?
Ans. $\frac{1}{5}\frac{9}{2}\frac{7}{8}\frac{9}{0}$.

67. From a year take $\frac{5}{7}$ of an hour. Ans. $\frac{1}{1}\frac{2}{2}\frac{2}{2}\frac{8}{6}\frac{3}{4}$.

68. From 99 take $\frac{7}{1}\frac{}{2}$. Ans. $98\frac{5}{1}\frac{}{2}$.

69. From $11\frac{7}{6}$ take $5\frac{3}{6}$. Ans. $6\frac{1}{6}$.

70. From $98\frac{3}{1}\frac{3}{2}\frac{}{3}$ take $45\frac{2}{2}\frac{6}{3}$. Ans. $52\frac{1}{1}\frac{1}{2}\frac{8}{5}$.

MULTIPLICATION OF VULGAR FRACTIONS.

Rule. Reduce whole or mixt numbers to improper fractions, compound fractions to simple ones, then multiply the numerators into each other for the numerator of the product, their denominators into each other for the denominator of the product.

Note. A fraction is best multiplied by an integer by dividing the numerator by it, if it can be, otherwise, multiply the denominator by it. Proof by Division.

Examples.

71. Multiply $\frac{5}{7}$ by $\frac{7}{9}$.
$5\times7=\frac{35}{63}=\frac{5}{9}$. Ans. $\frac{5}{9}$.
72. Multiply $12\frac{3}{19}$ by $6\frac{7}{11}$. Ans. $80\frac{1}{19}\frac{3}{3}$.
73. What is the product of $\frac{7}{9}$ and 14? Ans. $10\frac{2}{9}$.
74. What is the product of 8 and $\frac{4}{5}$ of 9? Ans. $57\frac{3}{5}$.

DIVISION OF VULGAR FRACTIONS.

Rule. Prepare the fractions as in multiplication; then invert the divisor, and proceed as in multiplication.

Proof. By multiplication.

Examples.

75. Divide $\frac{5}{6}$ by $\frac{3}{4}$.
$5\times4=\frac{20}{24}=\frac{5}{6}$. Ans. $\frac{5}{6}$.
76. What is the quotient of $\frac{4}{5}$ by 7? Ans. $\frac{4}{3}\frac{4}{5}$.
77. Divide 8 by $\frac{4}{5}$ of 9. Ans. $1\frac{1}{9}$.
78. Divide $8\frac{1}{2}$ by $7\frac{5}{7}$. Ans $1\frac{1}{1}\frac{1}{0}\frac{1}{8}$.
79. Divide $\frac{3}{5}$ of $\frac{2}{3}$ by $\frac{4}{9}$ of $6\frac{1}{4}$. Ans. $\frac{1}{1}\frac{8}{2}\frac{8}{5}$.
80. Divide 8 by 12. Ans. $\frac{2}{3}$.

Note. Multiplication and division of vulgar fractions, as in whole numbers, mutually prove each other. That the rules give a true result will appear evident by putting any two whole numbers into the form of fractions, and working with them as these rules direct, and then comparing the result of this operation, with that of the same kind in whole numbers.

PRACTICAL QUESTIONS IN VULGAR FRACTIONS.

1. What is the sum, difference, product and quotient of $\frac{18}{19}$ and $\frac{13}{17}$?

Ans. sum, $1\frac{823}{323}$. diff. $\frac{59}{323}$. product, $\frac{234}{323}$. quotient $1\frac{59}{247}$.

2. The difference of two numbers is $1\frac{3}{24}$, the less number $2\frac{1}{8}$; what is the greater number ? Ans. $3\frac{4}{8}$.

3. What number is that, which, if added to $3\frac{4}{8}$, will give the sum $8\frac{2}{11}$? Ans. $4\frac{7}{11}$.

4. What is $\frac{5}{8}$ of $130\frac{2}{3}$? Ans. $81\frac{2}{3}$.

5. What number is that, which, if multiplied by $\frac{3}{8}$ will produce $25\frac{3}{8}$? Ans. $42\frac{1}{3}$.

6. What number is that, which, if divided by $\frac{7}{9}$ will be $10\frac{1}{9}$? Ans. 14.

DECIMAL FRACTIONS.

1. A DECIMAL is the tenth part of an unit.

2. If 1 lb. or yd. was divided into ten equal parts, and each of these parts into ten other equal parts, and each of these again into ten others, and so on in a ten-fold proportion, without end, then would an expression of any number of these parts be called a decimal fraction.

3. The denominator of a decimal fraction is always 1, with as many ciphers annexed as the decimal has places. The denominator therefore, being known, is never written, the parts being distinguished by a dot prefixed, called the *separatrix*, or *decimal point*; thus ,5=$\frac{5}{10}$.

4. The numerators of infinite decimals consist of the same figure, or figures, repeated; and their denominators consist of as many nines as there are figures in the repetend; thus $\dot{6}=\frac{6}{9}$, and $1\dot{3}\dot{4}=1\frac{34}{99}$.

5. A pure decimal is when the fraction is proper; as ,5=$\frac{5}{10}$.

6. A mixt decimal is when the fraction is improper; as $19{,}45=\frac{1945}{100}$, or $19\frac{45}{100}$.

7. When the denominator is an even part of the numerator, increased by affixing ciphers to it, the decimal equal in value to such a fraction will be *finite* and complete; as, $\frac{5}{10}$=,5.

8. But if the denominator is no even part of the numerator thus increased, the decimal equal in value to such a fraction will be infinite; that is, it will constantly repeat either one figure only, as $\frac{2}{3}$=,666, &c.; or else it will repeat a certain number of figures perpetually, as $\frac{1}{7}$= ,714285714285 &c.; and $\frac{3}{11}$=,181818 &c. forever.

9. Those decimals which constantly repeat or circulate, are called *repetends* or *circulates.*

10. Those decimals, in which one figure only repeats, are called a *single repetend;* as ,333 &c.

11. Those, in which several figures repeat, are called a *compound repetend;* as ,185185 &c.

12. A dot is placed over a single repetend, and over the first and last figure of a compound repetend, for the greater perspicuity in the operations of repeating decimals; as ,$\dot{3}$—$\dot{1}\dot{8}$—$\dot{1}85$ &c.

13. In a compound repetend, any one of the circulating figures may be made the first of the repetend; thus in the repetend 6,$\dot{8}395395\dot{3}95$ &c. it may be made 6,$\dot{8}3\dot{9}5\dot{3}$; or 6,$\dot{8}39\dot{5}39$. By which means any two or more repetends may be made to begin and end at the same place; and then they are said to be *similar* and *conterminous.*

14. If the numerator has not so many places as the denominator has ciphers, make them equal by prefixing ciphers; thus, $\frac{5}{100}$=,05; $\frac{7}{1000}$=,007.

15. In all decimal numbers, if the *decimal point* be removed one place towards the right hand, every figure will be increased in a ten-fold proportion; thus, 4,856—48,56 —485,6—4856, each of which is ten times of greater value than the one preceding. Consequently,

16. By removing the *decimal point* one place towards the left hand, the value will be decreased in a ten-fold proportion; thus, 4856,—485,6—48,56—4,856—,4856.

17. Ciphers, placed at the left hand of decimals, decrease their value in a ten-fold proportion, by removing them further from the decimal point; ,000005=$\frac{5}{1000000}$ or 5 parts of 1000000.

18. Ciphers, placed at the right hand of decimals, neither increase nor decrease their value; thus, ,5 or ,50, or ,5000 are equal to ,5=$\frac{1}{2}$.

19. All decimals, consisting of an equal number of places have a common denominator; and decimals of une-

qual denominators are reduced to a common denominator by annexing ciphers till they are equal in places; thus, ,6—,06—,006. may be reduced to the decimals ,600—,060—,006, each of which has 1000 for a common denominator.

TABLE OF NOTATION.

Whole Numbers.									*Decimal Parts.*							
8	7	6	5	4	3	2	1	0,	9	8	7	6	5	4	3	2	1
C. of Millions.	X. of Millions.	Millions.	C. of Thousands.	X. of Thousands.	Thousands.	Hundreds.	Tens.	Units.	Tenth parts.	Hundred pts.	Thousand pts.	X. Thousand pts.	C. Thousand pts.	Millions pts.	X. Million pts.	C. Million pts.	Thousand of Million pts.

20. It appears from the table, that as whole numbers increase in a ten-fold proportion towards the left hand, so decimals decrease in a ten-fold proportion towards the right hand.

21. The place of tenths, or the first from the decimal point, is of the greatest value; therefore that decimal is of the greatest value whose highest place is greatest, without any regard to the number of figures; so ,4 is greater in value than ,34788. This will appear evident by reducing them both to a common denominator; thus, 400000 is greater than 34788.

NOTE. Decimal Fractions, being the same in their nature and method of operation as whole numbers, may be performed with the same facility.

ADDITION OF DECIMALS.

CASE I.

To add finite decimals.

RULE. Place the numbers under each other according to the value of their places; add them as in whole num-

bers, set the decimal point as many places from the right hand as are equal to the greatest number of decimal places in any *one* of the given decimals.

PROOF. As in whole numbers.

EXAMPLES.

1.		2.	3.
83,845		38,45	1,874
,88435		8,078	43,8074
3,0085		43,34	,80735
487,08		1,04	,100734
,3874		38,7454	9,008
,0007		18,003	1,3471
575,20595	Sums	147,6564	56,944584

In example first, five being the greatest number of given decimals, therefore the decimal point is set five places from the right hand.

CASE II.

To add repeating decimals, when there is a single repetend.

RULE. Make them conterminous, that is, end together, and then add them as in whole numbers, adding to the last or left hand place of decimals, as many units as there are nines in the sum; the last figure will be one of the repetends.

EXAMPLES.

4. Add 123,23—63,516—0,3—8,8—4,83 and 18,016 together.

123,333
63,516
0,333
8,800
4,833
18,016

conterminous.

218,833

5. Add 8,342—8,8—3,1043 and 7,34 together.

8,3422
8,8888
3,1043
7,3444
conterminous.
27,6798

NOTE. In the 4th example the sum of the repetends is 21, which gives two nines, therefore 2 is added to the sum of the repetends. The sum of the repetends in example 5, being 17, gives one nine, therefore 1 is added to the sum of the repetends.

CASE III.

To add decimals having compound repetends.

RULE. From the place where all the repetends begin together, continue each decimal to a number of places equal to the *least common multiple* of all the number of figures in each repetend; then add as before directed, and to the last place add as many units as there are 10's in the place where all the repetends begin together, and the figures in these two places will be the *first* and *last* of the repetends.

EXAMPLES.

6. Add 2,9543—1,04—3,7—4,065826 and 4,731 together.

Number of figures in each repetend.

2	4,3,2,6,4
2	2,3,1,3,2
3	1,3,1,3,1
	1,1,1,1,1

2,954395439543
1,041041041041
3,737373737373
4,065826065826
4,731473147314

16,530109431099

3×2×2=12 least com. multiple=to the number of places to be in the repetend.

In the above example the number of 10's where the repetends begin is 2, therefore 2 is added to the last place or right hand figure.

SUBTRACTION OF DECIMALS.

Case I.

To subtract finite decimals.

Rule. Place the numbers according to their value; subtract as in whole numbers, and point off for decimals, as in Addition.

Examples.

	1.	2.	3.
From	793,74	38,4567	500
Take	324,73564	8,2	8,0074
	469,00436	30,2567	491,9926

Case II.

To subtract repeating decimals with single repetends.

Rule. Place and subtract them as usual, observing, when the subtrahend is the greater number, to increase the upper figure by 9 only, and in such case to carry 1 to the next place.

Examples.

	4.	5.	6.
From	$45,6\dot{3}333$	34,5289	14,4516
Take	$9,84136\dot{}$	$7,583\dot{3}$	$9,3\dot{0}\dot{0}\dot{0}$
	$35,79196\dot{}$	$26,9456\dot{}$	$5,1516\dot{}$

Case III.

When the decimals are compound repetends.

Rule. Prepare them as directed in Case II. in addition; then subtract, observing to add 1 to the right hand place of the subtrahend, if one is borrowed where the repetends begin together; the remainder either whole or in part will show the repetend.

Examples.

7.

From $9,4\dot{1}7\dot{8}$ take $5,5\dot{6}\dot{}$.

3.2

$3\times2=6=$multiple.

$9,4\dot{1}7\dot{8}1\dot{7}8$ } similar and
$5,5\dot{6}5\dot{6}5\dot{6}5$ } conterminous.

$3,8\dot{5}2\dot{1}6\dot{1}2$

MULTIPLICATION OF DECIMALS.

General Rule.

Case I.

Place the numbers under each other without any regard to their value; multiply them as in whole numbers, and, for decimals, point off from the right hand as many places in the product as there are decimal places in both the factors.

Examples.

	1.	2.	3.
Multiply	84,374	,347	8,434
by	8,5	7,04	,074
	421870	1388	33736
	674992	24290	59038
	717,1790	2,44288	,624116

Case II.

When there are not so many places in the product as there are decimals in the two factors.

Rule. Multiply as before, and make up the deficiency by prefixing ciphers.

Examples.

4.	5.	6.
5,72	3,347	,34567
,006	,0008	,0003
,03432	,0026776	,000103701

Case III.

To multiply any decimal by 10, 100, 1000, &c.

Rule. Remove the decimal point in the multiplicand as many places towards the right hand as there are ciphers in the multiplier.

7. Multiply ,8744 by 10, 100, 1000, &c.

Ans. 8,744—87,44—874,4.

Note. Any number multiplied by a pure decimal is diminished, but by a mixt, it is increased.

Case IV.

When the multiplicand has a single repetend and the multiplier a single figure.

Rule. Multiply as usual, observing to add to the last place in the product as many units as it contains nines, and that place will be a repetend.

Examples.

	8.	9.
Multiply	8,7016̇	4,305̇
by	5	8
	43,5083̇	34,444̇

Case V.

When the multiplier consists of several figures.

Rule. Multiply as before directed, making each particular product conterminous, by continuing the single repetend of each towards the right hand.

Examples.

	10.	11.
Multiply	234,64̇	84,36̇
by	,634	,425
	93857̇	42183̇
	70393̇3	16873̇3
	140786̇66	33746̇66
	148,76457̇	35,85583̇

Case VI.

When the multiplier is a repetend.

Rule. Multiply as usual; add a cipher to the product, or which is the same, cut off one decimal less than usual, and divide by 9, continuing the quotient till it becomes a single or compound repetend, which will be the answer.

Examples.

12.	13.	14.
Multiply 8,35	712,54	37,23
by ,04	,03	,26
9)3,340	9)213,763	9)22,340
,371=true product.	23,75148	2482
		7446
		9,928

Case VII.

When the multiplicand is a compound repetend, and the multiplier a single figure only.

Rule. Multiply as in whole numbers, observing to add to the right hand place of the product *as many units* as there are *tens* in the product of the left hand place of the repetend. The product will contain a repetend whose places are equal to those in the multiplicand.

Examples.

15.	16.	17.
Multiply 582,347	924,378	3749,23
by 8	,03	,007
4658,778	27,73135	26,24464

Case VIII.

When the multiplier consists of several figures.

Rule. Multiply as before, making each particular product conterminous towards the right hand.

EXAMPLES.

18.

Multiply 873,2586
by 43,7

61128106
26197759$_{7}$
349303^{4}6$_{34}$

38161,40338

19.

8427,3012
4370,2

168546025
589911089$_{11}$
252819038$_{100}$
337092050$_{9205}$

36828992,02332

CASE IX.

When the multiplier is a compound repetend.

RULE. Multiply each figure in the repetend, as in whole numbers, and add the several products together; then add the result to itself by placing the first left hand figure so many places forward as exceeds the number of places in the repetend by one, and the rest of the figures in order after it; proceed thus till the result last added be carried *beyond the first result*; add these several results together, beginning under the right hand place of the first, and from that place point off with a dot as many figures for a repetend as there are figures in the repetend of the multiplier.

EXAMPLES.

	20.	21.
Multiply	1235,01	42710,36
by	3,26	,20403
	741006	12813108
	247002	17084144
	37050^{3}	8542072
First result.	4026,1326	8714,1947508 first result.
	40261326	87141975
	4026 &c.	871 &c.
True product	4030,1627	8714,2818936

Case X.

When the multiplicand and multiplier both are compound repetends.

Rule. The places of the repetend in the product will be uncertain as to their number, and can only be determined by continuing and repeating the first product, which will contain a *certain repetend*, being equal in places to those of the multiplicand.

Note. If the finite figures, (that is the figures preceding the repetend) are few, and the places of the repetend many, the work may be shortened by subtracting the finite figures from those of the repetend, which will give a new multiplier.

Examples.

22.

Multiply 3,145 by 4,297

4,297
4=finite part.
4,293=new multiplier.

3,145
4,293

9436
28309 0
6290 0 0
12581 8 1 8

First product 13503436 3 6 3 6 &c.
13503436 3 &c.
135034 &c.
135 &c.

True product 13,5169533

DIVISION OF DECIMALS.

Case I.

Rule. Place the numbers and divide them as in whole numbers, and point off, at the right hand, for decimals, as many places as the decimal places in the dividend exceed those in the divisor.

OBSERVATION 1. If after dividing there should not be so many places in the quotient and divisor together as there are in the dividend, make them equal by prefixing ciphers to the quotient.

2. The quotient figure is always of the same value with that figure of the dividend, under which the unit's place of its product stands. Or,

3. The decimals in the quotient and divisor added together must always be equal in number with those in the dividend.

4. When the decimal places in the divisor and dividend are equal in number, the quotient will be whole numbers.

5. When the decimals in the *dividend* exceed those in the *divisor*, the decimals in the *quotient* must be equal to that excess.

6. If the decimals in the divisor exceed those in the dividend, they must be made equal by annexing ciphers to the dividend; and then all the figures in the quotient will be whole numbers, till all the ciphers annexed are used.

7. When there is a remainder after division, ciphers may be annexed to the dividend, and the work prolonged at pleasure, and in such cases the quotient will be decimals.

In division of decimals, there may occur nine varieties, with respect to the nature of the three sorts of numbers; viz.

1. Integers, or whole numbers.

2. Mixt numbers, that is, integers and decimals.

3. Pure decimals, that is, without any whole numbers. The dividend, therefore, being itself of three kinds, and capable of a divisor of three kinds, there may arise nine varieties, viz.

1. A whole number may be divided by a { **Whole number.** / **Mixt number.** / **Decimal.**

2. A mixt number may be divided by a { **Whole number.** / **Mixt number.** / **Decimal.**

3. A pure decimal may be divided by a { **Whole number.** / **Mixt number.** / **Decimal.**

The various cases more fully explained by the subsequent operations at large, will, with attention to the preceing observations, render Division of Decimals sufficiently easy and plain.

The whole may be exemplified in this simple example; Let 1866 be divided by 12.

First variety. 12)1866,0

155,5 **(By obs. 7 and 5.)**

In variety first the divisor and dividend are both whole numbers, and because there was a remainder of 6 a cipher is annexed to the dividend (obs. 7.) which gives one decimal figure in the quotient (obs. 5.)

Variety 2d. 12)186,60

15,55 **(By obs. 5.)**

Variety 3d. 12),18660

,01555 **(By obs. 1.)**

Variety 4th. 1,2)1866,0

1555 **(By obs. 4 and 6.)**

Variety 5th. 1,2)186,60

155,5 **(By obs. 3 and 5.)**

Variety 6th. 1,2),18660

,1555 **(By obs. 3.)**

Variety 7th. ,12)1866,00

15550 **(By obs. 4 and 6.)**

Variety 8th. ,12)18,660

155,5 **(By obs. 5.)**

Variety 9th. ,12),18660

1,555 **(By obs. 5.)**

The following examples will further illustrate the general rule, and more clearly exemplify the preceding observations.

10. Divide 295,75 by 8,45.

295,75÷8,45=35 **Ans.**

11. Divide ,4884 by ,0074.

4884÷,0074=66 **Ans.**

NOTE 1. In examples 10 and 11, the decimals in the divisor and dividend are equal, the quotients, therefore, in both instances are whole numbers. See obs. 4.

12. Divide 780,516 by 24,3.

780,516÷24,3=32,12 **Ans.**

13. Divide ,3953 by ,67.

,3953÷,67=,59 **Ans.**

2. In examples 12 and 13, the decimal places in the dividend exceed those in the divisor by 2 figures; therefore two figures are pointed off for decimals in the quotient. See obs. 5.

14. **Divide 192,1 by 7,684.**

192,1÷7.684=25 **Ans.**

15. **Divide 441 by ,7875**

,7875)441,0000(560 **Ans.**
39375

47250
47250

00

3. In examples 14 and 15, the decimal places in the dividend are not so many as those in the divisor by 3 and 4, therefore ciphers are annexed (See obs. 6.) to make them equal; and the quotient is whole numbers. See observation 4.

16. **Divide 7,25406 by 957.**

7,25406÷957=,00758 **Ans.**

17. **Divide ,0007475 by ,575.**

,0007475÷,575=,0013 **Ans.**

4. In examples 16 and 17, after the division was finished there were not so many places in the quotient and divisor added together, as there were in the dividend; therefore, they are made equal by prefixing 2 ciphers to the quotient. See obs. 1.

Case II.

To divide any whole, mixt, or decimal number by 10, 100, 1000, &c.

Rule. **Remove the decimal point towards the left hand *so many places,* as there are ciphers in the divisor.**

Examples.

1. **Divide 1866 by 10, 100, 1000, &c.**

Ans. 10)186,6 100)18,66 1000)1,866 &c.

Case III.

When the dividend has a single repetend and the divisor a single finite figure.

Rule. **Divide as usual, and when the repetend is brought down the quotient will begin to repeat.**

EXAMPLES.

2. Divide 734,02 by 8.

8)734,02

91,77 perpetual repetend.

3. Divide 3184,0 by ,6.

,6)3184,0

5306 perpetual repetend.

CASE IV.

When the divisor contains a number of finite figures.

RULE. Divide as usual, and the quotient will repeat a single figure, but will not always begin when the repetend is brought down.

EXAMPLES.

4. Divide 79,26 by,48.

,48)79,26(165,138

48

312
288

246
240

66
48

186
144

426 } perpetual
384 } repetend.

42

5. Divide 106036,783 by 487,65.

487,65)106036,783(217,4

97530

85067
48765

363028
341355

216733 } perpetual
195060 } repetend.

21673

CASE V.

When the divisor is a single repetend and the dividend a finite number.

RULE. Multiply the dividend by 9, cut off from the right hand of the product one figure more than usual (this being the same as dividing by 10) for a new dividend; then divide the new dividend as usual, and the quotient will be the answer. Or place the given dividend under *itself*, but one place forward towards the right hand, and subtract; the remainder will be the new dividend.

EXAMPLES.

6. Divide 572,4 by ,8. Or, 572,4
9 5724 a figure forward.

,8)515,16=new divid'd. ,8)515,16 as before.

643,95 Ans. 643,95 Ans.

CASE VI.

When the divisor consists of finite numbers joined to the repetend, and the dividend is finite.

RULE. Subtract the finite numbers of the divisor from the *divisor itself*, and the remainder will be a new divisor, then prepare the dividend as in Case V. for a new dividend which divide as usual.

EXAMPLES.

7. Divide 8569,88 by 4,86.

From 4,86 From 8569,38
Take 48=finite number. Take 856988

4,38=new divisor. 7712,892=new dividend.
Then 7712,892÷4,38 =1760,9 Ans.

CASE VII.

When there is a repetend both in the divisor and dividend.

RULE. Prepare them as before directed in Cases V. and VI. then divide and the quotient will be either *finite*, a single, or a compound repetend.

EXAMPLES.

8. Divide 234,6 by 7. 9. Divide 134,26 by ,6.

From 234,66 From 134,266
Take 2346 13426

7)211,20=new dividend. ,6)120,84 =new dividend.

30,1714285=Ans. 201,4=Ans.

CASE VIII.

When the divisor or dividend, or both contain compound repetends.

RULE. Set the divisor and dividend under themselves so many places forwards to the right hand, as there are places in the repetend of the divisor exclusively; subtract them and the remainders will be respectively a new divisor and dividend.

EXAMPLES.

10. Divide 243,306 by 111,98.

From 243,306 — 111,98
243 — 11

243,063=new dividend. 111,87=new divisor.

111,87)243,063(2,172 Ans.

NOTE 1. If there is no finite part in the divisor, no subtraction must be made from it.

11. Divide 395,273614 by ,317.

395,273614
395273

,317)394,878341(1245,673 Ans.

2. If there is no repetend in the divisor, whatever the dividend may be, no subtraction is to be made either in the divisor, or dividend.

12. Divide 319,28007112 by 764,5.

764,5)319,28007112(,4176375 Ans.
30580
13480
7645
58350
53515
48357
45870
24871
22935
19361
15290
40712
38225
2487

Perpetual repetend

NOTE. 1. A series of nines, *infinitely* continued, is equal to *unity*, or one, in the next left hand place; thus, 0,999 &c. is equal to 1; and ,0999 &c.=,1; and ,00999 &c.=,01; and 54,999 &c.=55.

DEMONSTRATION. It is obvious that ,9=$\frac{9}{10}$ wants only $\frac{1}{10}$ of unity, and ,99 wants only $\frac{1}{100}$, ,999 wants only $\frac{1}{1000}$, of unity; so that if the series were continued to *infinity*, the *difference* between that *series of nines* and an *unit*, would be equal to *unity* divided by *infinity*, that is, *nothing*.

2. A single repetend multiplied by 10, and then subtracted from that product, the remainder will be the same number, made finite, in the next superior place; thus ,6666 &c. multiplied by 10 will be equal to 6,666 &c.; from which subtract ,666 &c. there will remain 6 a whole number; as 6,666 &c.;

666 &c.;

6 ···=whole number.

3. If, therefore, a compound repetend be multiplied by an unit with as many ciphers annexed as are equal to the number of places in the repetend, and then subtracted from that product, there will remain at the left hand the same numbers *made finite* which made the repetend; thus ,$\dot{3}\dot{2}\dot{5}$ multiplied by 1000=$\dot{3}\dot{2}\dot{5}$,325 from which if ,$\dot{3}\dot{2}\dot{5}$ be subtracted, there will remain 325 made finite.

4. If any repetend be multiplied by so many times as it contains places, the result will be the repetend made finite, for any number multiplied by 10 and once subtracted is the same as multiplied by 9; thus ,666 &c. ×9=5,999 &c.=6. by note 1. And ,$\dot{5}\dot{2}\dot{7}$× 999=526,$\dot{9}\dot{9}\dot{9}$=$\dot{5}\dot{2}\dot{7}$. by note 1.

REDUCTION OF DECIMALS.

CASE I.

To reduce a vulgar fraction to its equivalent decimal.

RULE. Divide the numerator with ciphers annexed, by the denominator, the quotient will be the decimal.

EXAMPLES.

1. Reduce $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ to decimals.

4)1,00 2)1,0 4)3,00

,25 Ans. ,5 Ans. ,75 Ans.

2. Reduce $1\frac{1}{2}$ to a decimal. Ans. ,916.

NOTE. A whole number may be expressed decimally by annexing ciphers and the decimal point; thus, 874=874,000 &c.

Case II.

To reduce coins, weights, measures and time to decimal fractions.

Rule. Place the numbers perpendicularly under each other, beginning with the lowest denomination, and, after annexing ciphers, divide it by *so many* as make one of the next higher denomination, as in Reduction Ascending; continue thus to divide till it is reduced as high as the question requires; the last quotient will be the decimal.

Examples.

3. Reduce 12 8½ qrs. to the decimal of a £.

4)2,0

12)850

20)127083

,635416£. Ans. ,635416£.

4. Reduce 4s. to the decimal of a guinea. Ans. ,142857.
5. Reduce 7 13 pwt. to the decimal of a pound Troy. Ans. ,6375.
6. Reduce 4 2 13 lb. to the decimal of a ton. Ans. ,230803571428.
7. Reduce 3 14 lb. to the decimal of cwt. Ans. ,875.
8. Reduce 4 1 2 inches to the decimal of a mile. Ans. ,00249368.
9. Reduce 52 days to the decimal of a year. Ans. ,142465753.
10. Reduce 3 18 14 18 seconds to the decimal of a year. Ans. ,01030117960426.

Case III.

To reduce shillings, pence and farthings to decimals by inspection.

Rule. To half the greatest even number of shillings, add the farthings contained in the given pence and farthings, increasing the second decimal place by 5, when the shillings are odd, and the third place by 1 when the farthings exceed 12, and by 2 when they are more than 36; the three places will be the decimal.

EXAMPLE.

11. Reduce 12 8½ qrs. to the decimal of a pound.

6 =half the greatest even number of shillings.
34=farthings in the given pence and farthings.
1=excess of 12.

,635=decimal of a £. Ans. ,635 £.

NOTE. If the second and third places of the decimal are 25, 50, or 75, the decimal is finite and complete; but if not, more figures may be found by the following,

RULE. If the second and third figures are under 25, multiply them by 4, and for every 24 add 1 to the product, and the result will be more places which may be annexed to the former number. If the second and third places are more than 25, multiply the excess of 25, 50, or 75 by 4, adding 1 for every 24, and so on till the decimal becomes finite or infinite.

EXAMPLE.

12. Reduce 12 8½ qrs. to the decimal of a £.

6 =half even shillings.
34=farthings in 8½.
1=excess of 12.

635=decimal of a £.

63541

635416

More figures than three.
10=excess of 25.
4

40
1=24's in 40.

41=two more figures.
16=excess of 25.
4

64
2=24's in 64.

66=two more figures.

,635416 Ans.

NOTE. Half the even number of shillings, with the decimal point prefixed is their decimal, and when the shillings are odd, a cipher annexed and divided by 2, the quotient will be the decimal.

13. Reduce 1, 2, 3, 4, 5, 6, 7, shillings to decimals.

Answers ,05–,1–,15–,2–,25–,3–,35.

Case IV.

To find the value of a decimal.

Rule. Multiply the given decimal by so many of the next less denomination as make one of the same with the given decimal, as in Reduction Descending, and cut off from the right hand of the product, as many places for decimals, as there are decimals in the given fraction; in this manner proceed till the decimal is reduced to the lowest denomination, each time cutting off as before; the several denominations on the left hand will be the answer.

Examples.

14. What is the value of ,635416̇ of a £?

20

12,70833̇

12

8,50000

4

2,0000 Ans. 12 8½ qrs.

15. What is the value of ,142857̇ of a guinea?
Ans. 4*s.*

16. What is the value of ,6375 of a lb. Troy?
Ans. 7 13 pwt.

17. What is the value of ,230803571428̇ of a ton?
Ans. 4 2 13 lb.

18. What is the value of ,875 of a cwt? Ans. 3 14 lb.

19. What is the value of ,00249368̇ of a mile?
Ans. 4 1 2 in.

20. What is the value of ,142465753̇ of a year?
Ans. 52 days.

21. What is the value of ,01030117960426̇ of a year?
Ans. 3 18 14 18 seconds.

Case V.

To find the value of any decimal of a pound by inspection.

Rule. Double the first decimal figure for shillings, adding one when the second figure is more than 4; call

the figures in the second and third places, after deducting 5, so many farthings, abating one when they exceed 12 and two when they exceed 35.

EXAMPLES.

22. Find by inspection ,635 of a £.

s. 12=double the first decimal.

8½=farthings in 2d and 3d decimals,

——— abating for excess of 35.

12 8½ qrs. Ans. 12 8½ qrs.

23. Find by inspection the value of ,038 of a £.

Ans. 9*d.*

24. Find by inspection the value of ,004 of a £.

Ans. 1*d.*

CASE VI.

To reduce any finite or pure infinite decimal to its primitive vulgar fraction.

RULE. Reduce the fraction to its lowest terms, and it will form the fraction required.

NOTE. The denominator of a finite fraction is an unit, with as many ciphers annexed as there are figures in the decimal; and the denominator of an infinite decimal is as many nines as there are figures in the repetend.

EXAMPLES.

25. Reduce ,25 to its primitive vulgar fraction.

$25)\frac{25}{100}=\frac{1}{4}$. Ans. $\frac{1}{4}$.

26. Reduce $,\dot{6}$ to a vulgar fraction.

$3)\frac{6}{9}=\frac{2}{3}$. Ans. $\frac{2}{3}$.

27. Reduce $,\dot{3}45$ to a vulgar fraction. Ans. $\frac{114}{333}$.

CASE VII.

To reduce a mixt decimal to its primitive vulgar fraction.

RULE. Reduce the finite and circulating parts, each to a vulgar fraction, separately; add them together, and their sum will be the fraction required.

NOTE. 1. The finite part of a fraction is the figures, which precede the repetend, and has always 10, 100, &c. for its denominator; the circulating part is the repetend, whose denominator is always 9, 99, &c.

2. If the given repetend has one or more ciphers prefixed, or is one or more places from the decimal point, so many ciphers must be annexed to the denominator; and if the repetend includes a whole number, as many ciphers must be annexed to the numerator as that number contains figures.

Examples.

28. What is the primitive vulgar fraction of ,16 ?

$\frac{1}{10}$=finite part. $\frac{6}{90}$=circulating part.

$\frac{1}{10}\times\frac{6}{90}=\left.\begin{matrix}90\\60\end{matrix}\right\}$ numerators.

150=sum nume. $\frac{150}{900}=\frac{1}{6}$. Ans. $\frac{1}{6}$.

10×90=900=com. denom.

29. Reduce ,0047 to a vulgar fraction.

$\frac{004}{1000}$=finite part. $\frac{7}{9000}$ circulating part.

$\frac{4}{1000}\times\frac{7}{9000}=\left.\begin{matrix}7000\\36000\end{matrix}\right\}$ numerator. $\frac{43000}{9000000}=\frac{43}{9000}$ Ans.

43000=sum numer.

1000×9000=9000000=common denom.

30. Reduce 31,62 to a vulgar fraction.

$\frac{3}{1}\times\frac{1620}{999}=\left.\begin{matrix}29970\\1620\end{matrix}\right\}$ numerators. $^{3}\frac{1590}{999}=31\frac{23}{37}$ Ans.

31590=sum of numerators.

1×999=999=com. denominator.

31. Reduce ,138 to a vulgar fraction. Ans. $\frac{46}{333}$.

Case VIII.

To make fractions similar and conterminous, that is, to begin and end at the same place.

Rule. 1. Find the least common multiple of the several numbers of places in each repetend of the given decimals.

2. Make the new repetend equal in number with the least common multiple, already found, beginning the repetend as many places from the decimal point as are equal to the greatest given number of finite places, or where the finite part ends.

EXAMPLE.

32. Make the following repetends similar and conterminous.

Unequal.			Similar and conterminous.
,6	2)2 6		,66666666
,045			,04545454
,027	1 3×2	6 least com. multiple of the several given repetends.	,02777777
,025			,02500000
,142857			,14285714

FEDERAL MONEY.

1. By an act of the government of the United States, accounts must be kept in dollars, dimes, cents, and mills. These denominations perfectly correspond in their nature with decimal fractions, increasing and decreasing in tenfold proportion. The method of operation, therefore, is the same as decimal fractions, or whole numbers.

2. By an act of Congress it was resolved, that there should be

				Pure.	*Standard.*
Two Gold coins; viz.	1. The Eagle	=$10	weighing	247,5 grs.	270 grs.
	2. The half Eagle	=5		123,75	135
Six Silver coins; viz.	1. The Dollar	=1		371,25	416
	2. Half Dollar	=,50 cents.		185,625	208
	3. Quarter Dollar	=,25		92,8125	104
	4. Double Dime	=,20		74,25	83,2
	5. Dime	=,10		37,125	41,6
	6. Half Dime	=,05		18,5625	20,8
2 Copper coins; viz.	1. The Cent	=,10 mills.		208	208
	2. The half Cent	=,5 mills.		104	104

Any sum in federal money may be read either in the lowest denomination, or partly in the higher, and partly in the lowest; thus, $54,321 may be read 54321 mills, or 5432 cents 1 mill, or 543 dimes 2 cents 1 mill, or 5 eagles 4 dollars 3 dimes 2 cents 1 mill; all which denominations may be easily distinguished by the decimal point, thus

Eag. dol. di. cent. mill.
5, 4, 3, 2, 1.

The method best adapted to practical purposes, and which has been sanctioned by a law of the United States, is the decimal form of expression by a decimal point, making the dollar the *money unit*. Dollars, therefore, will occupy the place of units, and the less denominations will be decimal parts of a dollar and distinguished by the decimal point.

The established custom is to read them in dollars cents and mills ; thus, $54,32,1.

NOTE. Some accountants omit the decimal point, keeping the several denominations distinctly apart.

REDUCTION OF FEDERAL MONEY.

CASE I.

To change dollars into cents.

RULE. Add two ciphers.

EXAMPLE.

1. In $89 how many cents ? Ans. 8900 c.

CASE II.

To change dollars into mills.

RULE. Add three ciphers.

EXAMPLE.

2. In $79 how many mills ? Ans. 79000 m.

CASE III.

To change mills to dollars and cents.

RULE. Cut off the three right hand figures, the left hand figures will be dollars, the two first figures on the right hand will be cents and the third mills.

EXAMPLE.

3. In 8748 mills how many dollars and cents ?
$8,748=$8,74,8 Ans. $8,74,8.

CASE IV.

To reduce cents to dollars.

RULE. Cut off the two right hand figures for cents, the left hand figures will be dollars.

EXAMPLE.

4. Reduce 74874 cents to dollars. Ans. $748,74.

CASE V.

To change pounds to dollars.

RULE. Add a cipher and divide by 3.

EXAMPLES.

5. Reduce £36 to dollars.

3)360

$120 Ans. $120.

6. In £225 how many dollars? Ans. $750.

CASE VI.

To reduce pounds and shillings to dollars, cents and mills.

RULE. To the pounds annex half the greatest even number of shillings, to which annex three ciphers if the shillings are even; but if the shillings are odd, to the pounds annex a 5 and two ciphers; divide by 3, cut off three right hand figures for cents and mills, the left hand figures will be dollars.

EXAMPLES.

7. In £44 16 how many dollars, cents and mills?

44=pounds.
8=half the greatest even number of shillings.
000

3)448000

$149,33,3⅓ Ans. $149,33,3⅓.

8. Reduce £74 15 to dollars, cents and mills.

3)747500

$249,16,6⅔ Ans. $249, 16,6⅔.

CASE VII.

To reduce pounds, shillings, pence and farthings to dollars, cents and mills.

RULE. For the shillings proceed as in Case VI. to which add the farthings contained in the given pence and farthings, increasing their number by 1 when they exceed 12, by 2 when they are more than 35, to which annex one cipher; divide the whole by three, and cut off three right hand figures for cents and mills, the left hand figures will be dollars.

EXAMPLES.

9. In £34 18 9½ how many dollars, cents and mills?

3)349400

$116,46,6⅔ Ans. $116,46,6⅔.

10. In £93 11 4¾ how many dollars and cents?

Ans. $311 90.

CASE VIII.

To reduce dollars to pounds and shillings.

RULE. Multiply the dollars by 3, doubling the right hand figure for shillings.

EXAMPLES.

11. In $128 how many pounds and shillings?

128
3

£38 8 Ans. £38 8.

12. In $74 how many pounds and shillings?

Ans. £22 4.

CASE IX.

To change dollars and cents to pounds, shillings, &c.

RULE. Multiply the dollars and cents by 3, and cut off three right hand figures; the figures on the left hand will be pounds, and those on the right decimals of a pound, which being multiplied by 20, 12 and 4, (as in Case IV. Reduction of Decimals,) each time cutting off the three right hand figures, will give the answer; or the value of the three right hand figures may be found by inspection, (as in Case V. of Decimals.)

EXAMPLE.

13. In $344 48 how many pounds, shillings, &c.?

3

£103,344
20

s. 6,880
12

d. 10,560
4

qrs. 2,240

Or by Inspec. 344,48
3

103,344
6 10½=value of ,344 by in.

Ans. £103 6 10½.

Case X.

To reduce dollars, cents and mills, to pounds, shillings, pence and farthings.

Rule. Multiply the given sum by 3 and cut off four right hand figures, and proceed as in Case IX.

Example.

14. In $116,46,6⅔ how many pounds, &c. ?

	3
£	34,9400
	20
s.	18,8000
	12
d.	9,6000
	4
qrs.	2,4000

Ans. £34 18 9½.

Case XI.

To change Sterling to Lawful Money.

Rule. Add ⅓ to the Sterling the sum will be Lawful.

Example.

15. In £347 Sterling, how much Lawful ?

3)347=sterling.
115 13 4 added.

£462 13 4=lawful. Ans. £462 13 4.

Case XII.

To change Lawful to Sterling Money.

Rule. From the Lawful subtract ¼, the remainder will be Sterling.

Example.

16. Reduce £462 13 4 Lawful to Sterling.

4)462 13 4=lawful.
115 13 4 subtract.

£347 00 0=sterling. Ans. £347.

Case XIII.

To reduce New-England, Virginia, Kentucky and Tennessee currency to Federal Money.

Rule. Add a cipher to the pounds and divide by 3.

Note. If there are shillings, pence, &c. given in any case, they must always be reduced to the decimal of a pound and annexed to the given pounds before dividing by 3; and in all such cases three figures must be cut off at the right hand for decimals of a dollar.

Examples.

17. Reduce £36 to Federal Money.

3)360

120 Ans. $120.

18. Reduce £45 16 to Federal Money.

Ans. $152,66,6⅔.

Case XIV.

To reduce New-York and North-Carolina currency to Federal Money.

Rule. Add a cipher and divide by 4.

Example.

19. Reduce £44 New-York and North-Carolina currency to Federal Money.

4)440

110 Ans. $110.

Case XV.

To reduce New-Jersey, Pennsylvania, Delaware and Maryland currency to Federal Money.

Rule. Multiply by 8, and divide the product by 3, the quotient will be the answer.

Example.

20. Reduce £243 New-Jersey to Federal Money.

8

3)1944

648=federal money. Ans. $648.

Case XVI.

To reduce South-Carolina and Georgia currency to Federal Money.

Rule. Multiply by 30 and divide the product by 7, the quotient will be the answer.

Example.

21. Reduce £300 South-Carolina and Georgia to Federal Money.

300
30

7)9000

1285,71,4$\frac{3}{7}$=federal. Ans. $1285,71,4$\frac{3}{7}$.

Case XVII.

To reduce Canada and Nova Scotia currency to Federal Money.

Rule. Multiply by 4, and the product will be dollars.

Example.

22. Reduce £150 Canada or Nova Scotia to Federal Money.

150
4

$ 600=Federal. Ans. $600.

Case XVIII.

To reduce Livres Tournois to Federal Money.*

Rule. Multiply the Livres by 4 and divide by 21.

Example.

23. Reduce 1000 livres to federal money.

1000
4

21)4000(190,47,6$\frac{4}{21}$. Ans. $190,47,6$\frac{4}{21}$.

* The term "Tournois," when applied to money in France, is of the same import as "Sterling" when applied to money in England.

Case XIX.

To reduce Federal Money to New England, Virginia, Kentucky and Tennessee currency.

Rule. Multiply by 3, and cut off three right hand figures, the left hand figures will be pounds, the figures cut off, decimals of a pound, the value of which may be found as in Case IX.

Example.

24. Reduce $345,69 to Massachusetts, &c. currency.

345,69
3

£103,707=£103 14 1¾. Ans. £103 14 1¾.

Case XX.

To reduce Federal Money to New York and N. Carolina currency.

Rule. Multiply the dollars and cents by 4 and cut off three right hand figures for decimals, the left hand figures will be pounds.

Example.

25. Reduce $961,54¾ to New York and N. Carolina currency.

961,54¾
4

£384,619=£384 12 4½. Ans. £384 12 4½.

Case XXI.

To reduce Federal Money to New Jersey, Pennsylvania, Delaware and Maryland currency.

Rule. Multiply by 3 and divide by 8, cut off three right hand figures for decimals.

EXAMPLE.

26. Reduce $382 98 4 to New Jersey currency.
$382 98 4×3÷8=£143 12 4½. Ans. 143 12 4½.

CASE XXII.

To reduce Federal Money to South Carolina and Georgia currency.

RULE. Multiply by 7 and divide by 30, cut off three right hand figures for decimals.

EXAMPLE.

27. Reduce $530 01 to South Carolina and Georgia currency.
530 01×7÷30=£123,689=Ans. £123 13 4½.

CASE XXIII.

To reduce Federal Money to Canada or Nova Scotia currency.

RULE. Divide by 4, the quotient will be pounds and decimals.

EXAMPLE.

28. Reduce $494 50 8 to Canada or Nova Scotia currency.

4)494,50,8

£123,627 123 12 6½. Ans.

CASE XXIV.

To reduce Federal Money to Livres Tournois.

RULE. Multiply by 21 and divide by 4, the quotient will be livres.

EXAMPLE.

29. Reduce $190 47 $6\frac{4}{9}$ to Livres Tournois.
$190 47 $6\frac{4}{9}$×21÷4=1000. Ans. 1000.

ADDITION OF FEDERAL MONEY.

Rule. Place the several denominations under each other, and add them as in whole numbers, or decimals.

TABLE OF FEDERAL MONEY.

10 Mills marked m. . . .	make	1 Cent	marked c.
10 Cents		1 Dime . . .	d.
10 Dimes		1 Dollar	$ or dolls.
10 Dollars		1 Eagle . .	Eag.

Note. When the number of cents is less than 10, a cipher must always be written in the place of dimes; as ,09=nine cents, &c.

Examples.

Add 8 eag. 6 dolls. 4 dim. 8 m.;—7 dolls. 6 dim. 7 cents, 8 mills;—8 dolls. 8 dim.—9 dim. 8 cents;—4 eag. and 8 mills together.

First method.

Eag.	$	*d.*	*c.*	*m.*
8	6	4	0	8
	7	6	7	8
	8	8	0	0
		9	8	0
4	0	0	0	8
14	3	8	7	4

*Second method.

$.	*c.*	*m.*
6	40	8
7	67	8
8	80	0
	98	0
40	00	8
$143	87	4

* Note. The second method is preferable, and is adopted in this work.

Proof. As in whole numbers.

SUBTRACTION OF FEDERAL MONEY.

Rule. Place the several denominations and subtract them as in whole numbers, or decimals.

Examples.

	1. $. *c.* *m.*	2. $. *c.* *m.*	3. $. *c.* *m.*
From	873 28 2	48	348 43 3
Take	87 34 7	7 38 4	97
	785 93 5	40 61 6	251 43 3

4. From 2 eagles take ,49 3 mills. Ans. 1 9 50 7 m.

MULTIPLICATION OF FEDERAL MONEY.

Case I.

To multiply the several denominations by any given number.

Rule. Place the given numbers and multiply them as in whole numbers, or decimals, and point off in the product as in the multiplicand.

Note. In multiplying no regard should be paid to the decimal points.

Examples.

1.				2.			
	$.	c.	m.		$.	c.	m.
Multiply	4	83	6	Multiply	35	32	4
by			8	by			11
	$38	68	8		$388	56	4

3. Multiply $8 24 by 24. . . . . Ans. $197 76.
4. . . . $34 83 4 by 36. . . . . 1254 02 4.
5. . . . . 74 8 by 49. . . . . 36 65 2.
6. . . . . 09 7 by 700. . . . . 67 90.

Case II.

To find the value of goods in Federal Money.

General Rule.

Multiply the price by the quantity, and point off in the product, as in the given price.

Examples.

7. What will 8 yards cloth cost *a* $3 44 8 per yd.?

3 44 8=given price.
8=quantity.

$27 58 4=value of 8 yds. Ans. $27 58 4.

Questions.		*Answers.*
8.	What will 12 lb. cost *a* $0,09,3 m. per lb ?	$1 11 6.
9.	. . . 24 yds. . ,83,8 . yd. ?	20 11 2.
10.	. . . 77 yds. . ,34 . yd. ?	26 18.
11.	. . . 149 lb. . 7,30,3 . lb. ?	1088 14 7.
12.	. . . 200 yds. . ,11,2 . yd. ?	22 40.
13.	. . 1345 yds. . . ,23,3 . yd. ?	313 38 5.
14.	. . 3480 lb. . . ,29,1 . lb. ?	1012 68.

Case III.

When goods are bought or sold by the cwt. To find the value.

Rule. Multiply the given price by 112, or by 7, 8 and 2, and point off in the product, as in the given price; when there are more hundreds than one, multiply the price of one hundred by the given number of hundreds.

Examples.

15. What will 1 cwt. cost *a* $3 24 2 per lb. ?

3,24,2=given price.
112=lb. in cwt.

38904
3242

363,10,4=value cwt. Ans. $363,10,4.

Questions.		*Answers.*
16.	What will 1 cwt. cost *a* $1,08 . . .	$120 96.
17.	. . . 1 cwt. . . . ,34,3 . .	38 41 6.
18.	. . . 8 cwt. . . 3,34 . . .	2992 64.
19.	. . . 12 cwt. . . . ,84,2 . .	1131 64 8.
20.	. . . 24 cwt. . . . ,34 . . .	913 92.
21.	. . . 98 cwt. . . : ,08,7 . .	954 91 2.
22.	. . . 180 cwt. . . . . ,8 mills	161 28.

Case IV.

When articles are bought or sold by the thousand.

Rule. Multiply the price by the whole quantity and cut off three right hand figures for decimals, the left hand figures will be the answer in the lowest denomination mentioned in the given price.

NOTE. When the quantity is a greater number than the price, it will be more concise to multiply the quantity by the price, the result will be the same.

EXAMPLES.

23. What will 24570 feet of boards cost *a* $18 75 per M. ?

18,75=given price.
24570=quantity.

131250
9375
7500
3750

460,68,750=Ans. Ans. $460 68 7½.

24. What will 78455 bricks cost *a* $8 25 per M. ?
Ans. $647 25 3¾.

25. What will 43480 feet joists cost *a* $15 30 per M. ?
Ans. $665 24 4.

CASE V.

To find the value of parts of any quantity.

RULE. If the numerator of the fractional part is an unit, divide the given price of 1 lb. 1 yd. &c. by the denominator of the fraction; but if the numerator is more than 1, multiply the price by the numerator, and divide the product by the denominator, the quotient will be the answer.

EXAMPLES.

26. What will ⅛ of a yard cost *a* $4 84 per yard ?

denominator 8)4,84=price 1 yd.

,60,5=value of ⅛ yd. Ans. $0 60 5.

27. What will ⅜ of a yard cost *a* $4,84 per yard ?

4,84=price 1 yd.
3=numerator.

denominator 8)14,52

$1,81,5=value of ⅜ yd. Ans. $1,81,5.

28. What will $\frac{11}{12}$ of a dozen cost *a* $9,50 per dozen ?
Ans. $8,70,8⅓.

29. What will $\frac{1}{10}$ of a lb. cost *a* $8,12 per lb. ?
Ans. $0,81,2.

Case VI.

When the quantity is a mixt number.

Rule. Multiply the price by the whole number, and for the fractional part, work as before; or reduce the mixt number to an improper fraction and proceed as in Case V.

Examples.

30. What will 18⅞ yards cost *a* $3,84 per yard?

3,84=price 1 yd. 3,84 Or, 18⅞=¹⅛¹.
18=whole number. 7=numer. 3,84×151÷8=
$72,48 as before.
3072 denom. 8)26,88
384
$3,36=value ⅞ yd.
69,12=value 18 yds.
added 3,36=value ⅞ yds.
$72,48=value 18⅞ yds. Ans. $72,48.

Questions.				*Answers.*
31.	What will 24½ yards cost *a* $3,24 per yd.?			$79,38.
32.	42¾ yds.	,84,6		36,16,6½.
33.	69¼ yds.	4,38		304,95,7½.
34.	139¾ yds.	3,08		430,76.
35.	294⅜ yds.	,13,3		39,19,0⅛.
36.	500½ yds.	4,00,8		2005,00,2.
37.	348⅝ doz.	,8m.pr.dz.		2,79.
38.	1000¼ yds.	,34,8		348,21,7½.

DIVISION OF FEDERAL MONEY.

Case I.

General Rule.

Place the numbers and divide them as in whole numbers, or decimals, and the quotient will be the answer in the same denomination as the lowest in the dividend, which may be reduced to its proper denomination.

Proof. By Multiplication.

Note. When the quantity is a composite number, divide the price by the component parts, which make the quantity.

EXAMPLES.

1. Divide $34,48,4 by 4.
4)34,48,4

$8,62,1 Ans.

2. Divide $434,88 by 12.
12)434,88

$36,24 Ans.

	Dividends.	*Divisors.*	*Quotients.*
3. Divide	$197,76	by 24 . . .	$8,24
4. .	36,65,2	by 49 . . .	,74,8.
5. .	10,50	by 125 . . .	,08,4.
6. .	67,90	by 700 . . .	,09,7.

CASE II.

To find the value of 1 *yd.* 1 *lb. &c. in Federal Money.*

RULE. Divide the whole value by the whole quantity, and the quotient will be the answer in the lowest denomination to which the dividend was reduced.

EXAMPLES.

7. If 8 yards cost $27,58,4 what will 1 yd. cost?
whole quantity 8)27,58,4=value of the whole quantity.

$3,44,8=price of 1 yd. Ans. $3,44,8.

Questions.			*Answers.*
8. If 12 lb. cost	$1,11,6	what will 1 lb. cost?	$0,09,3m.
9. 24 yds.	20,11,2	. . . .	,83,8.
10. 77 yds.	26,18	. . . .	,34.
11. 149 lb.	1088,14,7	. . . .	7,30,3.
12. 1345 yds.	313,38,5	. . . .	,23,3.
13. 200 yds.	22,40	. . . .	,11,2.
14. 3480 lb.	1012,68	. . . .	,29,1.

CASE III.

When goods are bought or sold by the cwt. To find the value of 1 *lb.*

RULE. Divide the given value by 112, or by 7, 8 and 2, the last quotient will be the answer, in the same denomination, to which the dividend was reduced.

Examples.

15. If 1 cwt. cost $363,10,4 what will 1 lb. ?

```
112)363,10,4(3,24,2.
    336
    ---
    271
    224
    ---
    470
    448
    ---
    224
    224
    ---
      0
```

Or thus

```
7)363,10,4
---------
8)51,87,2
---------
2)6,48,4
---------
$3,24,2 as before.
```

Ans. $3,24,2.

Questions.				*Answers.*
16.	If 1 cwt.	cost $120,96	what will 1 lb. cost ?	$1,08.
17.	1 .	38,41,6		,34,3.
18.	8 .	2992,64		3,34.
19.	12 .	1131,64,8		,84,2.
20.	24 .	913,92		,34.
21.	98 .	954,91,2		,08,7.
22.	180.	161,28		,00,8.

Case IV.

When articles are bought or sold by several thousands, to find the price of one thousand.

Rule. To the given price annex three ciphers, and divide it by the given quantity, the quotient will be the price of one thousand, in the lowest denomination in the given price.

Examples.

23. If 24570 feet of boards cost $460,68,7½, what will 1 M. cost ? Ans. $18,75.

24. If 78455 bricks cost $647,25,3¾, what will 1 M. cost ? Ans. $8,25

25. If 43480 feet joists cost $665,24,4, what will 1 M. cost ? Ans. $15,30.

Case V.

When the quantity is a fraction to find the value of one.

Rule. If the numerator is an unit, multiply the given value of 1 lb. &c. by the denominator of the fraction ; but

if the numerator is more than 1, multiply the given value by the denominator and divide the product by the numerator, the quotient will be the answer.

EXAMPLES.

26. If $\frac{1}{8}$ of a yard cost $0,60,5, what will 1 yard cost?

,60,5=given value.
8=denominator.

$4,84,0=value of 1 yard. Ans. $4,84.

27. If $\frac{2}{4}$ of a yard cost $6,43,2, what will 1 yard cost?

6,43,2=given value.
4=denominator.

numerator 3)25,72,8

$8,57,6=value of 1 yd. Ans. $8,57,6.

28. If $\frac{1}{1\frac{1}{2}}$ of a dozen cost $8,70,8$\frac{1}{3}$, what will 1 dozen cost? Ans. $9,50.

29. If $\frac{1}{10}$ of a lb. cost $0,81,2, what is it a lb.? Ans. $8,12.

CASE VI.

When the quantity is a mixt number, to find the value of 1 lb. 1 yd. &c.

RULE. Multiply the whole number by the denominator of the fraction, adding to the product the numerator; place it over the denominator, then multiply the given value by the denominator, and divide the product by the numerator, the quotient will be the value of 1 lb. &c.

EXAMPLES.

30. If $18\frac{7}{8}$ yards cost $72,48 what will 1 yard cost?

18=whole number. Then 72,48=given value.
8=denominator. And, $\frac{1\frac{1}{8}}{}$ 8=denominator.

144 numerator 151)579,84(3,84=value 1 yd.
7=numerator added.

151=new numerator. Ans. $3,84.

Questions.			*Answers.*
31.	If $24\frac{1}{2}$ yds. cost	$79,38 what will 1 yard?	$3,24.
32.	$42\frac{3}{4}$ yds.	36,16,6$\frac{1}{2}$	,84,6.
33.	$69\frac{5}{8}$ yds.	304,95,7$\frac{1}{2}$	4,38.
34.	$139\frac{6}{7}$ yds.	430,76	3,08.
35.	$294\frac{2}{3}$ yds.	39,19,0$\frac{2}{3}$	,13,3.
36.	$500\frac{1}{4}$ yds.	2005,00,2	4,00,8.
37.	$348\frac{1}{4}$ doz.	2,79	,8.

PRACTICE.

PRACTICE is a contraction of the Rule of Three, when the first term happens to be an unit, and is a concise method of finding the value of goods.

Perhaps no method can be more simple and concise to find the value of goods in Federal Money, than the general rule of multiplying the price by the quantity, as given in Multiplication of Federal Money; therefore, the application of this rule to Federal Money is almost useless. Yet as English merchants, trading with Americans, make out the invoices of their goods in sterling money, an acquaintance with this excellent rule is necessary to every one, employed in mercantile pursuits.

Questions in this rule are performed by taking the aliquot, or even parts. The following table, therefore, should be committed to memory, or, at least, the rule for making it well understood, by the scholar.

TABLE OF ALIQUOT, OR EVEN PARTS.

Aliquot parts of a shilling.

d.	
1	is equal to $\frac{1}{12}$ of a shilling.
1½	$\frac{1}{8}$
2	$\frac{1}{6}$
3	$\frac{1}{4}$
4	$\frac{1}{3}$
6	$\frac{1}{2}$

Aliquot parts of a pound.

s.	
1	is equal to $\frac{1}{20}$ of a pound.
1,4	$\frac{1}{15}$
1,8	$\frac{1}{12}$
2	$\frac{1}{10}$
2,6	$\frac{1}{8}$
3,4	$\frac{1}{6}$
4	$\frac{1}{5}$
5	$\frac{1}{4}$
6,8	$\frac{1}{3}$
10	$\frac{1}{2}$

Aliquot parts of a penny.

qrs.	
1	is equal to $\frac{1}{4}$ of a penny.
2	$\frac{1}{2}$
3	$\frac{3}{4}$

Aliquot parts of a ton.

cwt.	
10	is equal to $\frac{1}{2}$ of a ton.
5	$\frac{1}{4}$
4	$\frac{1}{5}$
2½	$\frac{1}{8}$
2	$\frac{1}{10}$

Aliquot parts of a cwt.

qrs.	*lb.*	
2	or 56	$\frac{1}{2}$ of a cwt.
1	or 28	$\frac{1}{4}$
	14	$\frac{1}{8}$
	16	$\frac{1}{7}$
	8	$\frac{1}{14}$
	7	$\frac{1}{16}$
	4	$\frac{1}{28}$

Rules to find the aliquot parts which any given pence, shillings, pounds, &c. make of a *s.* £. ton, cwt. or ½ cwt.

To find the aliquot part of a shilling.

RULE. Divide 12*d.* by the given number of pence, the quotient will be the aliquot part of a shilling.

EXAMPLE.

What part of a shilling is 4*d.* ?

$12 \div 4 = \frac{1}{3}$ Ans.

To find the aliquot part of a pound.

RULE. Divide 20*s.* by the given number of shillings, the quotient will be the aliquot part of a pound.

EXAMPLE.

What part of a pound is 5*s.* ?

$20 \div 5 = \frac{1}{4}$ Ans.

To find the aliquot part of a ton.

RULE. Divide 20 cwt. by the given hundreds, the quotient will be the aliquot part of a ton.

EXAMPLE.

What part of a ton is 5 cwt.

$20 \div 5 = \frac{1}{4}$ Ans.

To find the aliquot part of a cwt.

RULE. Divide 112 lb. by the given number of lbs. the quotient will be the aliquot part of a cwt.

EXAMPLE.

What part of a cwt. is 16 lb. ?

$112 \div 16 = \frac{1}{7}$ Ans.

To find the aliquot part of ½ cwt.

RULE. Divide 56 lb. by the given pounds, the quotient will be the aliquot, or even part.

EXAMPLES.

What even parts of ½ cwt. are 14 lb. 8 lb. and 7 lb. ?

$56 \div 14 = \frac{1}{4}$ Ans. $56 \div 8 = \frac{1}{7}$ Ans. $56 \div 7 = \frac{1}{8}$ Ans.

NOTE. By these rules the preceding tables may be easily made, or the aliquot part of any given price be found ; that is, by dividing the integer by any given number of the same name, which will divide it without a remainder, the quotient will be the even or aliquot part.

To find the value of goods.

General Rule.

1. Suppose the price of the given quantity to be 1*d.* 1*s.* 1 £. per yd. &c.; then the given quantity itself would be the answer at the supposed price.

2. Divide the given price into aliquot parts, either of the supposed price, or of one another, and the sum of the quotients belonging to each will be the true answer required.

Case I.

When the price is farthings.

Rule. Find the value of the given quantity at a penny per lb. or yd. &c. then divide by the aliquot parts of a penny; and by 12 and 20, the last quotient will be the answer.

Examples.

1. What will 4678 yds. cost at ¼, ½ and ¾ per yard?

qrs.	*d.*	
¼	¼	4678 *a* ¼ per yard.
	12	1169½
	2,0	9,7 5½
		£4 17 5½ Ans.

4678 yards *a* ½ per yard.

Ans. £9 14 11.

4678 yards *a* ¾* per yard?

Ans. £14 12 4½.

* In all cases where the given price is not an even part it must be reduced into even parts, and the sum of the quotients will be the answer.

Case II.

When the price is pence.

Rule. Find the value of the given quantity at 1s. per yd. lb. &c.; then divide by the aliquot part, or parts, and by 20; the last quotient will be the answer.

Examples.

2. What is the value of 8745 yards cloth *a* 1*d.*–1½*d.*–2*d.*–3*d.*–4*d.*–5*d.*–6*d.*–7*d.*–8*d.*–9*d.*–10*d.* and 11*d.*, per yd.

d.	*s.*		*d.*		
1	1/12	8745 yds.	4	1/3	8745 yds. *a* 5*d.*
	2,0	72 ,8 9	1	1/4	2915 728 9
		£36 8 9 Ans.		2,0	364 ,3 9
1½	1/8	8745 yds.			£182 3 9 Ans.
	2,0	109 ,3 1½			
		£54 13 1½ Ans.			
2	1/6	8745 yds.			
	2,0	145 ,7 6			
		£72 17 6 Ans.			
3	1/4	8745 yds.			
	2,0	218 ,6 3			
		£109 6 3			
4	1/3	8745 yds.			
	2,0	291 ,5			
		£145 15 Ans.			

Questions.	*Answers.*
3. 8745 yds. *a* 6*d.*	£218 12 6.
4. . . . *a* 7*d.*	£255 1 3.
5. . . . *a* 8*d.*	£291 10.
6. . . . *a* 9*d.*	£327 18 9.
7. . . . *a* 10*d.*	£364 7 6.
8. . . . *a* 11*d.*	£400 16 3.
9. 8743½ *a* 9*d.*	£327 17 7½.
10. 840¾ *a* 10*d.*	£35 0 7½.
11. 3800 lb. *a* 11½*d.*	£182 1 8.

Case III.

When the price is shillings and pence.

Rule. Find the value of the given quantity *a* 1£ per yd. lb. &c. then divide by the aliquot part or parts, the quotient will be the answer in pounds.

Examples.

12. What will 8845 yards cost *a* *s.* 1–*s.* 2–*s.* 3–*s.* 4 and *s.* 5 per yd.?

s.	£.		*Questions.*	*Answers.*
1	$\frac{1}{2,0}$	8845 yds.	13. What cost 5674 lb. at 3 4*d.* per lb.?	£945 13 4
		£442 5 Ans.		
2	$\frac{1}{10}$	8845 yds.	14. . . . . 7484½ lb *a* 6 8*d.*	£2494 16 8.
		£884 10 Ans.	15. . . . . 8450¼ lb. *a* 9 8*d.*	£4084 5 9.
2	$\frac{1}{10}$	8845 yds.	16. . . . . 7484¾ yds. *a* 13 4*d.*	£4989 16 8.
1	½	884 10	17. . . . 8796½lb . *a* 17 4*d.*	£7623 12 8.
		442 5	18. . . . . 3000 lb. *a* 2 6*d.*	£375.
		£1326 15 Ans.	19. . . . . 734½ *a* 16*s.*	£587 12.
4	⅕	8845 yds.	20. . . . . 8040¾ *a* 16 8*d.*	£6700 12 6.
		£1769 Ans.	21. . . . . 1250¼ *a* 18*s.*	£1125 4 6.
5	¼	8845 yds.		
		£2211 5 Ans.		

Case IV.

When the price is pounds, shillings, pence and farthings.

Rule. Multiply the given quantity by the pounds; for the rest take parts.

Examples.

22. What will 8464 yards cost *a* £3 6 8 per yard?

s. d.

| 6 8 | ⅓ | 8464=quantity.
3=given pounds.

25392
2821 6 8

£28213 6 8 Ans. £28213 6 8.

23. What will 7848 lb. cost *a* £2 7 11½ per lb.?
Ans. £18818 17.

24. What will 2157 yards cost *a* £3 15 2¼ per yard ?
Ans. £8108 19 5¼.

25. What will 4374½ lb. cost *a* £7 10 1½ per lb. ?
Ans. £32836 1 9¼.

Case V.

When the price and quantity are both of several denominations.

Rule. Multiply the price by the integers of the quantity and take parts of the integer for the rest.

Examples.

26. What is the value of 7 2 14 lb. *a* £3 10 14½ per cwt. ?

qrs.	*cwt.*	
		3 10 4½=given price.
		7=integers.
		24 12 7½
14lb.	¼	1 15 2¼
		8 9½
		£26 16 7¼

Ans. £26 16 7¼.

27. What will 4 3 24 lb. cost *a* $4,48 per cwt.
Ans. $22,24.

28. What will 12 1 18 lb. cost *a* $8,86,8 per cwt.
Ans. $103,85,2.

TARE AND TRET.

Tare and Tret are rules for deducting certain allowances, made by the seller to the purchaser, for the weight of the thing which contains the goods.

These allowances are made either at so much for the box, bag or barrel, at so much per cent. or so much in the gross weight.

1. Tare is an allowance for the weight of the box, bag, or barrel, containing the goods.

2. Tret is an allowance of 4 lb. on every 104 lb. for waste.

3. Cloff is an allowance of 2 lb. on every 3 cwt. made to the people of London only.

4. Gross weight is the whole weight of the goods, together with the thing containing them.

5. Suttle weight is when part of the allowances is deducted from the gross.

6. Net weight is the pure weight of the goods, when all allowances are deducted.

Case I.

When tare is so much per box, bag, or barrel, &c.

Rule. Multiply the number of boxes, bags or barrels, &c. by the tare, and subtract the product from the gross, the remainder will be the net weight.

Examples.

1. What is the net weight of 24 hhds. of tobacco, weighing 143 2 14 lb. gross; tare 84 lb. per hhd. and what is the value at $7,25 per cwt. ?

84=tare.
24=number hhds.

336
168

112)2016(18=tare.
112

896
896

0

143 2 14=gross.
18 0 0=tare.

125 2 14 lb.=net.

Ans. { 125 2 14 lb.
{ $910,78,1¼.

2. In 241 barrels of figs each weighing 3 19 lb. gross; tare 10 lb. per barrel; how many pounds net, and what is their value at 15¾ cents per lb.

Ans. { 22413 lb.
{ $3530,04,7½.

Case II.

When tare is so much in the whole gross weight.

Rule. Subtract the given tare from the gross, the remainder will be the net.

EXAMPLES.

3. Having deducted the tare, what is the value at $6,50 per cwt. of 88 hhds. tobacco, weighing 137 cwt. gross; tare 678 lb. in the whole?

Ans. { $851,15,1¼. / 130 3 22 lb.

4. At 10½ cents per lb. what is the value of 184 boxes of raisins, each weighing 33 lb. gross; tare 152 lb. in the whole?

Ans. { $606,80. / 5920 lb.

CASE III.

When the tare is so much per cwt.

RULE. Divide the gross by the aliquot part, which the tare makes of a cwt. as in Practice; subtract the quotient from the gross, the remainder will be the net.

EXAMPLE.

5. What is the net weight of 24 boxes of sugar, each weighing 7 2 13 lb. gross; tare 14 lb. per cwt. and what is the value at $11,75 per cwt.?

7 2 13 lb.=1 box.
4

30 1 24=weight of 4 boxes.
6

lb.	*cwt.*	
14	⅛	182 3 4=weight of 24 boxes.
		22 3 11=tare.

159 3 21 lb.=net.

Ans. { 159 3 21 lb, / $1879,26,5⅝.

6. At $10,50 per cwt. what is the value of 12 hhds. sugar, the gross weight being 93 1 19 lb.; tare 18 lb. per cwt.?

Ans. { $823,26,5⅝. / 78 1 17½ lb.

7. What is the net weight of 443 cwt. tallow gross; tare 17 lb. per cwt. and what is the value at 10½ cents per lb.?

Ans. { 375 3 1 lb. / $4418,92,5.

CASE IV.

When tret is allowed with tare.

RULE. Deduct the tare as before directed, then divide the suttle weight by 26, (which is the aliquot part that 4

lb. make on every 104 lb.) and the quotient will be the tret, which subtracted from the suttle, the remainder will be the net.

Examples.

8. What is the net weight of a hhd. tobacco, weighing 14 3 27 lb. gross; tare 16 lb. per cwt.; tret 4 lb. per 104 lb.; how many pounds net, and what is the value at 6¼ cents per lb.?

14 3 27=gross.
4

59
28

479
120

lb.	cwt.	
16	¼	1679=gross lb.
		239 13 oz.
4	1/28	1439 3=suttle.
		55 5=tret.

lb. 1383 14 oz.=net.

Ans. { 1383 14 oz. / $89,95,1¾.

9. What is the net weight of 4 hhds. sugar, weighing as follows; viz.

No. 1. 8 3 14 lb.
2. 4 2 19
3. 7 1 14
4. 14 2 23 gross; tare 19 lb. per cwt. and tret as usual, and what will it come to *a* $12,25 per cwt.?

Ans. { 28 1 21 lb. / $348,35,9¾.

Case V.

When cloff is allowed with tare and tret.

Rule. Deduct the tare and tret as before directed, then divide the suttle by 168 (it being the aliquot part which 2 lb. make on every 3 cwt.) the quotient will be the cloff, which subtracted from the suttle, the remainder will be the net.

EXAMPLE.

10. What is the net weight of 15 3 20 lb. gross; tare 7 lb. per cwt.; tret and cloff as usual.

lb.	*cwt.*	
7	$\frac{1}{16}$	15 3 20=gross.
		3 27 8=tare.
4	$\frac{1}{28}$	14 3 20 8=suttle tare.
		2 8 5=tret.
2	$\frac{1}{168}$	14 1 12 3=suttle tret.
		9 9=cloff.
		14 1 2 10=net.

Ans. 14 1 2 10 oz.

DUODECIMALS,

OR CROSS MULTIPLICATION.

DIMENSIONS are taken in feet, inches, and parts called seconds.

Glaziers' and Masons' work is measured by the foot.

Painting, plastering, paving are done by the yard.

Partitioning, flooring, slating, rough-boarding, by the square of 100 feet.

Stone and brick work by the rod of 16½ feet, whose square is 272¼. Bricks also are laid by the thousand.

GENERAL RULE.

1. Under the multiplicand write the corresponding denominations of the multiplier.

2. Multiply each term in the multiplicand, beginning at the lowest, by the feet in the multiplier, setting each result under its respective term, observing also to carry for every 12 from each lower to the next higher denomination.

3. Proceed in the same manner, and multiply the multiplicand by the inches in the multiplier, setting the result of each term one place more to the right hand of those in the multiplicand.

4. In the same manner multiply by the seconds (parts) in the multiplier, setting the result of each term one place more to the right of the last, and so on for thirds, fourths, &c.

NOTE. Shillings and pence may be multiplied as feet and inches.

EXAMPLE.

	1.	2.	3.	4.
	feet. in.	*feet. in.*	*s. d.*	*s. d.*
Multiply	3 4	6 3	2 3	1 6
by	7 10	8 6	2 3	1 6
	23 4	50 0	4 6	1 6
	2 9 4	3 1 6	6 9	9 0
	feet. 26 1 4	feet. 53 1 6	*s.* 5 0 9	*s.* 2 3

APPLICATION OF DUODECIMALS.

I. *Measuring by the foot square, as glaziers' and masons' work.*

5. There is a house with 4 tiers of windows, and 4 in each tier, the height of the first is 7 2 in. the second 6 8 in. the third 5 9 in. the fourth 4 6 in. the breadth of each 3 10 in. how many feet square are in the windows, and how much will the glazing come to *a* 20 cents per foot?

First tier	7 2 in.
Second	6 8
Third	5 9
Fourth	4 6
	feet 24 1=whole height.

feet 24 1=height.
4=numb. windows.

96 4
3 10=breadth.

289
80 3 4

feet 369 3 4=whole contents,
a 20 cents per foot is $73,86,6½.

Ans. { 369¼ feet, 4 parts.
{ $73,86,6½.

II. *Measuring by the yard square, as paviers', painters', plasterers' and joiners' work.*

NOTE. Divide the square feet by 9, the quotient will be square yards.

EXAMPLE.

6. A room is to be ceiled, whose length is 74 9 in. and width 11 6 in. what number of yards square is in the room, and what will the work amount to at 25 cents per yard?

Ans. { $95\frac{7}{12}$ yds. / $23,87,8.

III. *Measuring by the square of* 100 *feet, as rough boarding, slating, shingling, flooring, and partitioning.*

RULE. Multiply as before, and cut off two right hand figures in the integers.

EXAMPLES.

7. In 175 10 in. long and 9 10 in. high of partitioning how many squares? Ans. 17 squ. 29 f. 4 pts.

8. What will the slating of a house cost at $2,25 per square of 100 feet; the roof being 48 feet in length and 14 10 in. wide, and how many squares does it contain?

Ans. { $32,04. / 14 squares, 24 feet.

IV. *Measuring by the rod.*

NOTE. Bricklayers value their work at the rate of a brick and a half thick; and if the thickness of the wall is more or less, it must be reduced to that thickness, which may be done by the following,

RULE. Multiply the area of the wall by the number of the half bricks in the thickness of the wall, the product divided by 3 will give the area.

EXAMPLE.

9. If a brick wall is 4085 feet, and thickness $2\frac{1}{2}$ bricks; how many rods does it contain? Ans. 25 rods.

V. *To measure a ship's tonnage by carpenters' measure.*

RULE. Multiply the length, (of single decked vessels) breadth at the main beam, and depth of the hold, continually together, and divide the product by 95, the quotient will be the tons of such vessel.

EXAMPLE.

10. What is the tonnage of a single decked vessel, whose keel is 75 feet long, breadth at the beam 22 feet, and the hold 10 6 in.?

$75\times22\times10\frac{1}{2}=17325\div95=182\frac{7}{19}$ tons.

Ans. $182\frac{7}{19}$ tons.

VI. *To find the tonnage as established by the laws of the United States.*

RULE. 1. If the vessel is double decked, the length taken from the forepart of the main step to the after part of the stern post above the upper deck; the breadth at the broadest part above the main wales, half of which breadth is the depth of such vessel; deduct from the length *three-fifths* of the breadth, and multiply the remainder by the breadth, and that product by the depth, and divide by 95, the quotient will be the tons of such vessel.

2. If the vessel is single decked, take the length and breadth as before directed, then deduct from said length *three fifths* of the breadth and take the depth from the underside of the deck plank to the ceiling in the hold, multiply and divide as before, the quotient will be the tons of such vessel.

EXAMPLES.

11. What is the tonnage of a single decked vessel of the following dimensions, viz. the length 80 6 in. the breadth at the main beam 22 6 in. and the depth of the hold 9 6 in. government tonnage?

80 6=length.
13 6=$\frac{3}{5}$ breadth.

67 0
22 6

1474 0
33 6

1507 6
9 6=depth.

13567 6
753 9 0

95)14321 3 (150$\frac{71}{95}$ tons. Ans. 150$\frac{71}{95}$ tons, 3 parts.

12. What is the tonnage of a double decked vessel, whose length is 70 6 in. breadth 22 6 in. and depth 10 9 in, government tonnage ?

70 6=length.
13 6=$\frac{3}{5}$ breadth.

57 0
22 6=breadth.

1254 0
28 6

1282 6
10 9=depth.

12825 0
961 10 6

13786 10 6

95)13786 10 6)145$\frac{11}{95}$ tons.
95

428
380

486
475

11

Ans. 145$\frac{11}{95}$ tons.

VII. *To measure a round cistern.*

Rule. Multiply the diameter of the top and bottom together; from the product subtract $\frac{1}{3}$ of the square of their difference; multiply the remainder by the length of the stave or cistern, the product will be the solid contents in such parts, as those in which the dimensions are taken; If the dimensions are taken in inches, divide by 359 for beer or water and 294 for wine gallons.

Note. 100 gallons of water are equal to a hogshead.

Example.

13. How many hogsheads of water, each containing 100 gallons, will a cistern contain, measuring at the top diameter 4 feet, the bottom 4 6 in. and the length 10 feet ?

4 = 48 in. top diam.
4 6=54 bottom diam.

192
240

2592
deduct 12=$\frac{1}{3}$ square difference.

2580

120

359)309600(859÷100=8 hhds. 59 gals.

Ans. 8 hhds. 59 gals.

13. How many hogsheads of water and how many gallons of wine, will a cistern contain, whose dimensions are as follows; viz. the diameter at the top 3 feet, the bottom 3 6 in. and the length of the cistern 8 feet?

3 = 36=top diameter. 1500
3 6 in.=42=bottom diam. 96=inches in length.

.72 9000
144 13500

1512 359)144000(401=4 hhds. 1 gal. water or beer.
deduct 12=⅛ squ. of dif. 1436

1500 400
359

41

144000÷294=489 $\frac{9}{49}$ galls. Ans. 4 hhds. 1 gal. 489¾ gals.

VIII. *To measure planks or boards of equal breadth.*

Rule. Multiply the length by the width, the product will be the contents.

Examples.

14. What will a board measure which is 18 feet long and 1 2 in. wide?

18 0=length.
1 2=width.

18 0
3 0 0

feet 21 . .=contents. Ans. 21 feet.

15. What are the contents of a plank 24 6 in. long and 1 11 in. wide? Ans. 46 11 in. 6 parts.

Note. If the plank or board is tapering, add the width of both ends together and take half the sum for the mean width, which multiplied by the length will give the contents.

IX. *To measure scantling or small square timber.*

Rule. Multiply the width by the thickness and their product by the length, the last product will be the contents.

Example.

16. What are the contents of a piece of scantling 18 4 in. long, 1 9 in. broad and 6½ in. thick?

Ans. 17 f. 4 in. 6 6 parts.

X. *To measure wood.*

RULE. Multiply the length, breadth and height continually together, and divide the product by 128, the quotient will be cords; or divide the solid feet by 16.

NOTE. 128 feet make a cord of wood or bark.

EXAMPLE.

17. If a load of wood is 7 9 in. long; 3 6 in. wide and 4 10 in. high; how much does the load contain?

```
  7  9=lenght.        Or, 16)131 1 3(8 ft.=1cord 3 1 3 pts.
  3  6=width.              128
 ------                  -----
 23  3                      3
  3 10 6
 ------
 27  1 6
  4 10  =height.
 ------
108  6 0
 22  7 3
 ------
128)131  1 3(1 3 1′ 3″.
    128
    ---
      3                  Ans. 1 cord, 3 ft. 1 and 3 parts.
```

XI. *To measure stone walls of cellars, &c. which are laid by the perch of 24¾ cubic feet.*

RULE. Multiply the length, height and thickness of the wall continually together, the product divided by 24¾ will give the number of perches.

EXAMPLE.

18. A cellar wall is 8 feet high, 2¾ feet thick, and the sides and ends together 130 8 in. long: how many perches are in the wall?

```
  2  9=thickness.
  8   =height.
 ------
 22  0
130  8=length.
 ------
2874  8
   4 qrs.
 ------
24¾=99)11498  8(116 14/99 rods.      Ans. 116 14/99 rods.
```

XII. *To measure drains, vaults, dikes, cellars, &c.*

RULE. Multiply the length, width and depth in feet together and divide by 216.

NOTE. Diggers work by the square of 6 feet long, wide and deep, making 216 cubic feet to a square.

EXAMPLES.

19. There is a drain 200 feet long, $3\frac{1}{2}$ feet wide and $5\frac{3}{4}$ feet deep; how many squares does it contain?

Ans. $18\frac{137}{144}$ squares.

20. How many squares are in a vault 8 feet square and $9\frac{1}{2}$ feet deep? Ans. $2\frac{7}{12}$ squares.

XII. *To measure bales, trunks, chests, &c.; to ascertain their freight, which is commonly paid by the solid foot, or so much per ton of* 40 *feet.*

RULE. Find the solid contents as before and divide by 40, the quotient will be the tons.

EXAMPLES.

21. What is the freight of 5 bales of goods, each measuring 4 8 in. long, 3 9 in. wide and 2 10 in. thick, at $3 25 per ton?

```
 4  8=length.
 3  9=width.
-----
14  0
 3  6 0
-----
17  6
 2 10=thickness.
-----
35  0
14  7
-----
49  7
    5=number bales.
-----
40)247 11(6 7/10 and 11 parts        Ans. $20,14,3.
```

22. How many cubic feet are in 10 trunks, each measuring 4 2 in. long; 2 feet wide and 1 7 in. deep?

Ans. 131 11 in. 4 parts.

SINGLE RULE OF THREE DIRECT.

THE Rule of Three Direct teaches by three numbers given to find a fourth, which shall have the same proportion to the third, as the second has to the first.

When more requires more, or less requires less, the question belongs to the Rule of Three Direct.

More requiring more is when the third term is greater than the first, and requires the fourth to be greater than the second.

Less requiring less is when the third term is less than the first and requires the fourth to be less than the second.

Two of the given terms are called the "*terms of supposition*," and one the "demand," or the number which asks the question.

The terms of supposition have "*if*" before them, and the words "what cost ?" "what will ?" "how much ?" "how many ?" "how long ?" "how far ?" &c. are the terms which ask the question.

RULE TO STATE THE QUESTION.

Write that number which asks the question in the third place; that number which is of the same name with the one that asks the question must be put in the first place; that number, which is of the same name with the answer required, in the second or middle place.

GENERAL RULE TO WORK THE QUESTION.

Multiply the second and third numbers together, and divide the product by the first, the quotient will be the answer in the same denomination with the second or middle term.

PROOF. Invert the question, that is, put the fourth number or answer in the first place; the third number in the second; and the second in the third; work as before directed, and the quotient will be the first number.

Examples.

1. If 8 yards of cloth cost $4; what will 24 yards cost?

1st term. 2d term. 3d term.

yds. $. *yds.*

8 : 4 : : 24

4=2d. term.

1st. term 8)96

$12=4th. term and answer. Ans. $12.

Note. In this example, the first and third terms are of the same name, viz. yards, which must always be the case in stating questions in the Rule of Three; the fourth term or answer is of the same name with the middle or second term, viz. dollars; this also must always be the case in the Rule of Three.

Proof.

2. If 12$ will buy 24 yards; how many yards will $4 buy?

$. *yds.* $.

12 : 24 : : 4

4

12)96

yards 8 Ans. Ans. 8 yds.

Proof.

3. If 24 yards cost $12; what will 8 yards cost?

yds. $. *yds.*

24 : 12 : : 8

8

24)96(4$ Ans.

96

0 Ans. $4.

Proof.

4. If $4 will buy 8 yards; how many yds. will $12 buy?

$. *yds.* $.

4 : 8 : : 12

8

4)96

24 yds. Ans. Ans. 24 yds.

The three methods of proof are only the first question varied, and they will show how any question in this rule may be inverted.

A short and easy method of performing questions in the Single Rule of Three is by comparing the three given numbers together; the true answer will result from the nature of proportion; for as much greater or less as the third term is than the first; so much greater or less will the fourth term or answer be than the second. Thus in example 1st. 8 *yds.* : 4 $. : : 24 *yds.*; by comparing the third term (24) with the first term (8), it will be found to be three times greater than it; therefore, the fourth term or answer must, from the nature of proportion, be 3 times greater than the second term (4), which is 12, and the true answer, as by the operation above.

Observation I.

When the second number is of different denominations, it must always be reduced to the lowest mentioned in it; then multiply and divide as in the general rule, and the quotient will be the answer in the same denomination to which the second was redueed, and which should be brought into the highest for the answer.

Example.

5. **If 8 yards cost £34 12 6½; what will 32 yards cost?**

yards. £. s. d. qrs. yds.

8 : 34 12 6 ½ : : 32

20

692

12

8310

4

33242=farthings.

32

66484

99726

8)1063744=farthings.

132968=farthings Ans.

4)132968=farthings.

12) 33242=pence.

2,0) 277,0 2

£138 10 2.

Ans. £138 10 2.

Note. In example 5, the second term being in pounds, shillings, pence and farthings, is reduced to the lowest mentioned in it; viz. farthings; consequently the fourth term will be farthings, which are reduced to pounds &c. for the answer.

Observation II.

When the first and third numbers are of different denominations, they must be reduced to the lowest mentioned in either of them; then proceed as directed in the general rule.

Examples.

6. If 7 lb. sugar cost $1,75; what will 7 2 14 lb. cost?

lb. *$.* *cwt. qrs. lb.*

7 : 1,75 : : 7 2 14

4

30
28

854
1,75

4270
5978
854

7)1494,50

$213,50 Ans. $213,50.

Note. The first numbers being pounds weight, the third number is reduced to pounds.

7. If 7 2 14 lb. cost $213,50; what will 7 lb. cost?

Ans. $1,75.

Observation III.

When there is a remainder after division, which is of the same name with the second term, reduce it to the next lower denomination and divide as before; continue thus till it is reduced to its lowest denomination, each time dividing by the first term. Should there be a remainder, place it above the divisor, and annex the fraction thus formed to the quotient, observing first to reduce it to its lowest terms.

Examples.

8. If 7 oz. of gold is worth £30, or $30; what will a golden vase cost, which weighs 7 11 oz.?

oz. *£.* *lb.* *oz.*
7 : 30 : : 7 11
12
95
30
7)2850
£407 2 10$\frac{2}{7}$ $\frac{4}{7}$.

And 7 : 30 : : 7 11
oz. *$.* *lb.* *oz.*
12
95
30
7)2850
$407,14,2$\frac{4}{7}$.

Ans. £407 2 10$\frac{2}{7}$ $\frac{4}{7}$. or $407,14,2$\frac{4}{7}$.

9. If 7 11 oz. of gold is worth $ £407 2 10$\frac{2}{7}$ $\frac{4}{7}$; what is 7 oz. worth? Ans. £30.

10. If 3 lb of gold is worth £187, what is 1 oz. worth? Ans. £5 3 10$\frac{2}{7}$ $\frac{2}{7}$.

Observation IV.

When the first term is greater than the product of the second and third, consider the product as a remainder and reduce it as directed in Observation III.

Example.

11. If 48 yards cost £3 or $3, what will 12 yards cost?

yds. *£.* *yds.*
48 : 3 : : 12
3
48)36
20
48)720(15 *s.*

yds. *$.* *yds.*
48 : 3 : : 12
3
48)36,00(,75 c.

Ans. 15 *s.* ,75 ct.

Here the product of the second and third terms being less than the first term, it is reduced to the next lower denomination, giving 15*s.* and 75 cents for the quotients or answers.

Observation V.

When the question will admit it, multiply and divide as in Compound Multiplication and Division.

Examples.

12. If 4 yards cost £34 10 8½; what will 12 yds. cost?

yds. *£.* *s.* *d.* *yds.*
4 : 34 10 8½ : : 12
12

4)414 8 6

£103 12 1½ Ans. Ans. £103 12 1½.

13. If 24 lb. cost £4 8 10½; what will 96 lb. cost?

lb. *£.* *s.* *d.* *lb.*
4×6=24. 24 : 4 8 10½ : : 96
8 8×12=96.

35 11 0 0
12

4)426 12 . .

6)106 13

£17 15 6 Ans. £17 15 6.

Observation VI.

When the first term happens to be 1, the operation is performed by Compound Multiplication, and when the third term is 1, it is performed by Compound Division.

Examples.

14. If 1 cwt. cost £3 15 6½, or $12,75; what will 12 cwt. cost?

cwt. *£.* *s.* *d.* *cwt.*
1 : 3 15 6½ : : 12
12

£45 6 6 Ans. { £45 6 6. / $153.

15. If 12 cwt. cost £45 6 6, or $153; what will 1 cwt.?

12)45 6 6 or 12)153

£3 15 6½ $12,75 Ans. { £3 15 6½. / $12,75.

Having stated all the variety of cases which can occur in the Rule of Three Direct; and furnished plain examples for their illustration, the following promiscuous questions are subjoined for the pupil's exercise.

Questions.				*Answers.*
16. If 24 yds. cost	$0,84,4;	what will 72 yds. cost?		$2,53,2.
17. 108 yds.	4,84,6	. . .	648 yds?	29,07,6.
18. 1 cwt.	9,00,4	. . .	4 2 14 lbs. ?	41,64,3½.
19. 7 lb.	,38,9	. . .	3 cwt. ?	18,67,2.
20. 1 lb.	2,33,4	. . .	1 cwt. ?	261,40,8.
21. 1 cwt.	261,40,8	. . .	1 lb. ?	2,33,4.
22. 1oz. gold	17,36	. . .	1 grain ?	,03,6⅛.
23. 3 2 14 lb.750,		. . .	14 lb. ?	25,86,2⅔.

24. What is the interest of $874 *a* 6 per cent. for a year? Ans. $52,44.

25. A bankrupt's debts amounted to $4800, and his effects sold for only $1800; how much could he pay on a dollar? Ans. $0,37,5.

26. An invoice of goods amounted to $3480; what is the commission on the purchase at 3½ per cent? Ans. $121,80.

27. A bankrupt, whose debts amounted to $8749, compounded with his creditors for ,78 cents on a dollar; how much did he pay them? Ans. $6824,22.

28. A merchant bought 6 bales of cloth, each bale contained 6 pieces, and each piece 25 yards, at $52 per piece; what was the value of the whole, and what was it worth per yard? Ans. { $1872 whole. / $2,08 per yd.

29. In what time will $100 principal gain $75, at 6 per cent per annum. ? Ans. 12½ years.

30. A servant went to market with $8, and bought eggs at 25 cents a doz.; chickens *a* 75 cents a pair, and ducks *a* $1 a pair; he bought the same number of each kind; how many of each sort had he for his money? Ans. 4 of each.

31. A gentleman's annual income amounted to $40000; how much can he spend daily, that at the end of the year he may lay up $25000, and distribute to the poor, quarterly, $2500? Ans. 13,69.

32. A merchant effects ensurance on a ves[illegible] 43½ yds. cost? valued at $18545; what is the premium at 4½ A. Ans. $174,50.

RULE OF THREE IN VULGAR FRACTIONS.

The Rule of Three in Vulgar Fractions depends on the same principles as the Rule of Three in whole numbers.

General Rule.

1. Prepare the question as directed in the Rule of Three Direct.

2. Invert the terms of the first number, and multiply the numerators of the three numbers continually together; and all the denominators; their products will be the answer to the question.

Examples.

1. If $\frac{3}{5}$ of a yard cost £$\frac{2}{3}$; what will $\frac{7}{4}$ of a yard cost?

yds. £. yds.

$\frac{3}{5}$=first number inverted for the divisor.

Then, $\frac{3}{5} : \frac{2}{3} :: \frac{7}{4}$.

$8\times2\times7=\overline{112}$ new numer.
$3\times9\times8=216$ new denom.

And, $\frac{1}{2}\frac{1}{1}\frac{2}{6}=\frac{14}{24}=$£0 10 $4\frac{1}{2}$ $\frac{7}{4}$.

Ans £0 10 $4\frac{1}{2}$ $\frac{7}{4}$.

2. If $\frac{4}{5}$ of a lb. cost $\frac{2}{3}$ of a dollar; what will $\frac{8}{10}$ of a lb. cost? Ans. $\frac{8}{10}=11$, $2\frac{1}{2}$ mills.

Observation I.

When the first and third numbers only are fractions; and the second a whole number.

Reduce the first and third to a common denominator, and then rejecting the denominators, make the numerator of the first, the first number in stating the question; and the numerator of the third, the third number, and the given whole number the second; then proceed as in the Rule of Three of whole numbers.

Example.

3. If $\frac{3}{7}$ of cwt. cost $20; what will $\frac{4}{9}$ of a cwt. cost?

$3\times7=21$
$6\times8=48$ } new num. $\frac{21}{56}$ and $\frac{48}{56}$, Then 21 : 20 :: 48
$7\times8=56$ common denom.

£3 15 $ :: $ 16 : 45,71,4$\frac{4}{7}$.

48
21)960(45,71,4$\frac{4}{7}$.

Ans. $45,71,4$\frac{4}{7}$.

Observation II.

When either the first or third number is an unit, and the other a fraction.

Rule. If the first number is an unit, put the denominator of the fraction in its place, for the first number, and the numerator in the place of the fraction; but if the first number is the fraction, put its numerator for the first number, and the denominator the third, proceed as in whole numbers.

Examples.

4. If a ship and cargo are worth $18400; what are $\frac{7}{8}$ of them worth?

parts. $. *parts.*
8 : 18400 : : 7
18400×7÷8=16100

Ans. $16100.

5. If $\frac{7}{8}$ of a ship and cargo are worth $16100; what are the whole of them worth?

parts. $ *parts.*
7 : 16100 : : 8
16100×8÷7=18400.

Ans. $18400

THE RULE OF THREE IN DECIMALS.

Rule. Reduce vulgar fractions to decimals; state the question and proceed as in whole numbers, pointing off as in Multiplication and Division of Decimals.

Examples.

6. If $\frac{1}{2}$ yard cost $\frac{2}{5}$ of a £, what will $\frac{7}{8}$ yd. cost?

$\frac{1}{2}$=,5. $\frac{2}{5}$=,4. $\frac{7}{8}$=,875,
yds. £. *yds.* £.
Then as ,5 : ,4 : : ,875 : ,700=14*s.*

Ans. 14*s.*

7. If 4½ yards cost $9,75; what will 13½ yds. cost?

4½=4,5. 13½=13,5.
yds. $. *yds.*
Then 4,5 : 9,75 : : 13,5 : $29,25 Ans.

8. If 8¼ yards cost $34,90; what will 43¼ yds. cost?

yds. $. *yds.* $.
8,625 : 34,90 : : 43,125 : 174,50. Ans. $174,50.

RULE OF THREE INVERSE.

The Rule of Three Inverse has three numbers given to find a fourth, which shall have the same proportion to the second, as the first has to the third.

When more requires less, or less requires more, the question is Inverse proportion.

More requiring less is when the third number is greater than the first and requires the fourth to be less than the second.

Less requiring more is when the third number is less than the first and requires the fourth to be greater than the second.

General Rule.

State and prepare the question as in the Rule of Three Direct; multiply the first and second numbers together for a dividend and divide by the third; the quotient will be the answer in the same name with the second number.

Note 1. When there are fractions in the question proceed with them as in the Rule of Three of Vulgar Fractions.

2. A knowledge of Vulgar Fractions is absolutely necessary for the solution of many important questions in the Rule of Three Inverse; presuming, therefore, that the pupil fully understands them, the subsequent questions are proposed for his exercise.

Examples.

1. If 40 men can build a house in 180 days; how long will it take 80 men to build it?

men. days. men. days.
40 : 180 : : 80 : 90

Ans. 90 days.

Note. Questions in this rule may be performed in a concise manner, by comparing the third number with the first; for as much greater or less as the third number is than the first, so will the fourth number be less or greater than the second.

2. If $100 principal in 12 months will gain $6 interest; what principal will gain the same in 6 months?

mo. $. *mo.*
12 : 100 : : 6
12

6)1200

$200

Ans. $200.

In example 2d the third term is half as much as the first and therefore requires the fourth to be double the second; viz. 200 which is the answer.

3 My friend borrowed of me $250 for 3 months, promising me the like favour; soon after I had occasion for $300; how long may I keep it to receive full compensation for the kindness? Ans. $2\frac{1}{2}$ months.

4. How much in length, that is $2\frac{1}{2}$ inches wide, will make a foot square? Ans. $57\frac{3}{5}$ in.

5. How much in length, that is $12\frac{5}{8}$ poles in breadth, will make a square acre? Ans. $12\frac{6}{10}\frac{8}{1}$ poles.

6. If $3\frac{1}{2}$ yards of cloth, which is $1\frac{1}{6}$ yd. wide, will make a cloak, how much of that sort, which is $\frac{4}{4}$ yd. wide, will make one of the same size? Ans. $6\frac{8}{15}$ yds.

7. If a penny loaf of bread weighs $7\frac{1}{2}$ oz. when flour is 10 dollars per barrel; how much must the penny loaf weigh, when flour is $13,50 per barrel? Ans. $5\frac{12}{45}$ oz.

8. If a regiment consisting of 800 soldiers were to be clothed, each suit to take $3\frac{1}{4}$ yards of cloth, that is $1\frac{1}{4}$ yd. wide, to be lined with stuff $\frac{7}{8}$ yard wide; how many yards will it take to line the whole? Ans. 4828$\frac{1}{4}$ yds.

DOUBLE RULE OF THREE.

The Double Rule of Three is commonly composed of five numbers to find a sixth, which will bear the same proportion to the fourth and fifth, as the third bears to the first and second, when the proportion is *Direct.*

If the proportion is *Inverse*, the sixth number will bear the same proportion to the fourth and fifth, as the first bears to the second and third.

There are three terms of supposition, and two which ask the question. The word *if* precedes the terms of supposition, and the words "what will?" "how much?" "how long?" and the like, precede the question.

RULE TO STATE THE QUESTION.

1. Place the three terms of supposition in this order; put that number which is the cause of gain or loss, in the first place; that which expresses time, distance of place and the like, in the second place; and that which is the gain or loss in the third place.

2. Place the two numbers which ask the question under those of the supposition of the same name or kind.

RULE TO WORK THE QUESTION.

1. If the blank place fall under the third term of supposition, the question is in *Direct* proportion; therefore, multiply the two first terms together for a divisor, and the other three for a dividend, the quotient will be the sixth number or answer.

2. If the blank place fall under the first or second terms of supposition, the question is in *Inverse* proportion; then multiply the first, second and last terms together for a dividend, and the other two for a divisor, the quotient will be the answer.

EXAMPLES.

1. If $100 principal in 12 months gain $6 interest; what will $750 principal gain in 8 months?

Principal.		*mo.*		*Interest.*	
$.				$.	
100	:	12	: :	6	750=4th. term.
750	:	8			6=3d. term.
					4500
100=1st. term.					8=5th term.
12=2d. term.					
1200=divisor.					12,00)360,00=dividend.
					$30=interest. Ans. $30.

NOTE. In the above example, the blank place falls under the third term, therefore the proportion is *direct*; the answer is found by multiplying the first and second terms together for a divisor, and the other three for a dividend.

2. If $100 in 12 months will gain $6 interest; how long will it take $750 to gain $30 interest?

$.	*mo.*	$.	
100	: 12	: : 6	
750		30	Ans. 8 months.

NOTE. In example 2d. the blank falling under the second term, the proportion is *inverse*; therefore multiply and divide by rule 2d.

3. If 16 horses consume 84 bushels of grain in 24 days; how many bushels will suffice 32 horses, 48 days?

Ans. 336 bush.

4. If the carriage of 8 hhds. sugar, weighing 96 2 14 lb. 20 miles. cost $40; what weight can be carried 30 miles for $120, at the same rate? Ans. 193 1 qrs.

5. If 12 men, in 15 days, can build a wall 30 feet long, 6 feet high and 3 feet thick, when the days are 12 hours long; in what time will 60 men build a wall 300 feet long, 8 feet high and 6 feet thick, when they work only 8 hours each day? Ans. 120 days.

SINGLE FELLOWSHIP.

FELLOWSHIP is a rule by which merchants, and other persons trading in copartnership, so adjust their accounts, that each may have his share of the gain, or sustain his share of the loss, in proportion to his capital, employed in the joint concern.

The effects of a bankrupt may also be divided among his creditors, and legacies adjusted in case of any deficiency of effects.

CASE I.

When each man's stock, employed in trade, is equal.

RULE. Divide the whole gain or loss by the number of partners, and the quotient will be each man's share.

PROOF. Add the shares together, and their sum will be equal to the gain or loss. The remainders must be reduced to the same denomination and added together; the divisor will measure the sum, which being divided, the quotient must be added to the particular shares.

EXAMPLE.

1. Three men entered into copartnership with equal concern in the stock; they gained $1000; what is each man's share?

3)1000=gain.

333,33,3⅓=each man's share.

Ans. $333,33,3⅓.

Case II.

When the several stocks are unequal.

Rule. As the whole stock,
Is to the whole gain or loss;
So is each man's particular stock,
To his particular share of the gain or loss.

Examples.

2. Two merchants, A and B, entered into trade; A put into stock $9740, and B put in $8790; they gained $1874; what must each have of the gain?

$9740=A's stock.
8790=B's stock.

$18530=whole stock.

$. gain. $
18530 : 1874 : : 9740=A's stock.
1874

38960
68180
77920
9740

1853,0)1825276,0(985,03,$8\frac{586}{1853}$.
A's share.

$. gain. $
18530 : 1874 : : 8790 B's stock.
8790

168660
13118
14992

1853,0)1647246,0(888,96,$1\frac{1247}{1853}$. B's share.

Ans. { A's share $985,03,$8\frac{586}{1853}$.
B's share $888,96,$1\frac{1247}{1853}$.

3. Three shipwrights built a vessel for $15500; A advanced $4000, B $7000 and C $4500; the ship sold for $14850 only; what must each sustain of the loss?

Ans. { A's $167,74,$1\frac{11}{31}$.
B's $293,54,$8\frac{12}{31}$.
C's $188,70,$9\frac{7}{31}$.

4. A merchant failing in business, owes to four creditors as follows; viz. to A £135 10 6, to B £145, to C £154 9

and to D £160; the value of his effects is £252 17 6; what must each creditor receive and how much will each have on the pound?

Ans. { A's £57 12 0 0 $\frac{747726}{1427704}$.
B's £61 12 6 $\frac{1}{2}$ $\frac{693792}{1427704}$.
C's £65 12 10 $\frac{1}{2}$ $\frac{353388}{1427704}$.
D's £68 0 0 $\frac{1}{2}$ $\frac{190092}{1427704}$.
8 $6\frac{34}{77}$ d. on a pound.

5. A B and C entered into copartnership; A put into stock $875, B put in $987 and C put in $1190; they gained $950; what must each have of the gain?

Ans. { A's $272,36,$\frac{211766}{305252}$.
B's $307,22,$\frac{423532}{305252}$.
C's $370,41,$\frac{269754}{305252}$.

DOUBLE FELLOWSHIP.

Double Fellowship is Fellowship with time, and is when the stocks of partners are continued in trade for unequal times.

Rule. Multiply each man's stock by the time of its continuance in trade, then say, as in Single Fellowship,

As the sum of all the products,
Is to the whole gain or loss;
So is each man's particular product,
To his share of the gain or loss.

Proof. As in Single Fellowship.

Examples.

1. Two merchants entered into trade; A put into stock $2500 for 3 months; B 1800 for 5 months; they gained $875; what is each man's share of the gain?

2500×3=7500=A's product.
1800×5=9000=B's product.

$16500=sum of products.

$. $. *A's product.*
As 16500 : 875 : : 7500 : 397,72,$7\frac{3}{11}$=A's share of gain.
$. $. *B's product.*
As 16500 : 875 : : 9000 : 477,27,$2\frac{8}{11}$=B's share of gain.

Proof. A's share $397,72,$7\frac{3}{11}$. } Ans.
B's share $477,27,$2\frac{8}{11}$. }

Whole gain $875 . . . .

2. Three merchants entered into copartnership; A put into stock £294 14 for 3 months; B £240 10 for 4 months, and C £290 for 6 months; they gained £300; what is each partner's share of the gain?

Ans. { A's share £73 19 $2\frac{1}{2}$ $\frac{1}{11}\frac{0}{12}\frac{5}{12}\frac{5}{12}$.
B's share £80 9 $6\frac{1}{2}$ $\frac{2}{11}\frac{1}{12}\frac{7}{12}\frac{4}{12}$.
C's share £145 11 $2\frac{3}{4}$ $\frac{3}{11}\frac{9}{12}\frac{4}{12}\frac{3}{12}$.

3. Three persons entered into trade for 16 months; A at first put into stock $7400, but at the end of 4 months took out $2000, at the end of 12 months he put in $3000, but at the end of 14 months took out $850; B at first put in $5900 and at the end of 3 months put in $4300 more, but at the end of 9 months took out $4000 and at the end of 12 months put in $1500, but withdrew $2000 at the end of 14 months; C at first put in $12000, but at the end of 6 months took out 5000, and at the end of 9 months put in $3200, but at the end of 12 months took out $4000; they gained $8000; what must each partner have of the gain?

Ans. { A's share $2219,39,5$\frac{3}{7}\frac{7}{7}\frac{0}{4}$.
B's share $2634,87,0$\frac{6}{7}\frac{2}{7}\frac{0}{4}$.
C's share $3145,73,3$\frac{3}{7}\frac{2}{7}\frac{6}{4}$.

4. Three persons were concerned in an adventure; A advanced $4740 for 5 months; B $2700 for 6 months; C $4100 for 4 months; by miscalculations and failures they were involved to the amount of $1800; what must each sustain of the loss?

Ans. { A's loss $757,72,6$\frac{2}{6}\frac{8}{0}\frac{3}{3}$.
B's loss $517,93,9$\frac{3}{6}\frac{4}{0}\frac{3}{3}$.
C's loss $524,33,3$\frac{2}{6}\frac{2}{0}\frac{1}{3}$.

SIMPLE INTEREST IN FEDERAL MONEY.

INTEREST is a premium allowed for the use of money.

Simple Interest is that which arises from the principal only; and both the interest and principal are always the same as at first.

1. Principal is the money lent.

2. The rate per cent. per annum, or the ratio, is the sum per cent agreed upon, to be paid for every $100, or £, for the use of the principal one year.

3. Amount is the principal and interest added together.

The rules of Simple Interest will apply also to Commission, Factorage, Brokerage, Buying and Selling Stocks, Ensurance, and to any thing else, rated at so much per cent.

General Rule.

Multiply the principal by the rate per cent. and cut off two right hand figures in the dollars; if parts of a dollar are given, cut off as in the given principal.

Case I.

To find the interest for dollars only, for a year.

Rule. Multiply the principal by the rate per cent. and cut off the two right hand figures for cents, the left hand figures will be dollars.

Examples.

1. **What is the interest of $474 *a* 6 per cent. per annum?**

$474=principal.
6=rate per cent.

$28,44=interest for a year. **Ans. $28,44.**

Questions.	*Answers.*
2. What is the interest $247 *a* 4½ per cent.?	$11,11,5.
3. . . . . 879 *a* 6 per cent.?	52,74
4. . . . . 35 *a* 2¾ per cent.?	0,96,2½.
5. . . . . 149 *a* 5 per cent.?	7,45.
6. . . . . 2340 *a* 4¼ per cent.?	99,45.
7. . . . . 784 *a* 5⅝ per cent.?	43,90,4.
8. . . . . 1135 *a* 6¼ per cent.?	70,93,7½.

Case II.

To find the interest of dollars and cents for a year.

Rule. Multiply the principal by the rate and cut off four right hand figures for decimals; the left hand figures will be the interest in dollars, the two first decimals will be cents, the third mills, and the other the decimal of a mill.

Examples.

9. What is the interest of $378,48 *a* 4 per cent. per annum?

378,48=principal.
4=rate per cent.

$15,1392=interest for a year.
And $15,13,9,2=Ans. $15,13,9$\frac{1}{5}$.

Questions.		*Answers.*
10. What is the interest of	$578,89 *a* 6 pr. ct.?	$34,73,3$\frac{3}{5}$.
11.	988,38 *a* 5$\frac{1}{4}$ pr. ct.?	56,83,1.
12.	34,47 *a* 4 pr. ct.?	1,37,8$\frac{4}{5}$.
13.	175,98 *a* 6$\frac{1}{4}$ pr. ct.?	10,99,8$\frac{3}{4}$.
14.	639,73 *a* 6$\frac{3}{4}$ pr. ct.?	43,18,1.

Case III.

To find the interest of dollars, cents and mills for a year.

Rule. Multiply the principal by the rate and cut off five right hand figures for decimals; the left hand figures will be dollars, the two first decimals cents, the third mills and the others decimals of a mill.

Examples.

15. What is the interest of $454,37,6 *a* 6 per cent.?

454,37,6=principal.
6=rate per cent.

$27,26256=interest for a year.
$27,26,2,56=Ans. $27,26,2.

Questions.		*Answers.*
16. What is the interest of	$47,36,4 *a* 5 pr. ct.?	$2,36,8.
17.	734,48,7 *a* 4$\frac{1}{2}$ pr. ct.?	34,88,8.
18.	874,47,6 *a* 6 pr. ct.?	52,46,8$\frac{1}{2}$.
19.	98,27,8 *a* 6$\frac{1}{4}$ pr. ct.?	6,14,2.
20.	433,87,6 *a* 5$\frac{2}{5}$ pr. ct.?	24,29,7.
21.	787,34,7 *a* 1$\frac{1}{8}$ pr. ct.?	8,85,7.

Case IV.

To find the interest of any sum for several years and parts of a year, as months and days.

Rule. Find the interest of the given sum for a year, then multiply it by the given number of years, and for the months take the aliquot parts of a year, and, for the days, take the aliquot parts of a month.

Examples.

22. What is the interest of $487,24 for 4 years, 7 months and 10 days at 6 per cent. ?

		487,24=principal.
		6=rate per cent.
6	½	29,23,44=interest for one year.
		4=number of years.
mon.		116,93,76=interest for 4 years.
1	⅙	14,61,72=interest for 6 months.
10	⅓	2,43,62=interest for 1 month.
days.		81,20=interest for 10 days.
		$134,80,3 =interest for 4 years, 7 mo. and 10 days.

Ans. $134,80,3.

23. What is the interest of $478,48 for 3 years at 6 per cent. ? Ans. $86,12,6.

24. What is the interest of $987,36,3 for 2½ years at 5 per cent. ? Ans. $123,42.

25. What is the interest of $93,46 for 4½ years at 5¼ per cent. ? Ans. $22,07,9.

26. What is the interest of $4840 for 3 years, 4 months and 15 days at 6 per cent. ? Ans. $980,10.

Case V.

To find the interest for months at 6 per cent.

Rule. Multiply the principal by half the number of months and cut off as in the general rule.

Examples.

27. What is the interest of $75,24 for 8 months at 6 per cent. ?

75,24=principal.
4=½ the number of months.

$3,00,96=interest for 8 months. Ans. $3,00,9⅗.

28. What is the interest of $874 for 7 months ? Ans. $30,59.

29. What is the interest of 36,47 for 11 months ? Ans. $[illegible]1,5.

Case VI.

To find the interest for months and days at 6 per cent.

Rule. Multiply the principal by half the greatest even number of months, and $\frac{1}{6}$ of the given days and the days in the odd month if any; cut off one figure for a decimal, and proceed as in the general rule; observing, that in finding the sixth of the days, the remainder, if any, is a vulgar fraction, not a decimal, by which multiply as usual.

Examples.

30. What is the interest of $14,24 for 10 months and 24 days?

$\frac{1}{2}$)10=mo.

5=half mo.

6)24=days.

4=sixth of days.

14,24=principal.

half mo.= 5,4=$\frac{1}{6}$ of the days.

5696

7120

76,89,6=interest 10 months & 24 days. Ans. $0,76,8.

31. What is the interest of $24,17 for 11 months and 29 days?

24,17=principal.

5.9$\frac{5}{6}$=$\frac{1}{2}$ mo. & $\frac{1}{6}$ days.

21753

12085

2014=$\frac{5}{6}$

1,44,61,7=int. for given time.

$\frac{1}{2}$)11(5=half even mo.

30=days in the odd mo.

29=given days.

6)59

9$\frac{5}{6}$=sixth of days.

Ans. $1,44,6.

32. What is the interest of $35 for 7 months and 19 days? Ans. $1,33,5.

33. What is the interest of $784 for 9 months and 24 days? Ans. $38,41,6.

Case VII.

To find the interest for months at any rate per cent.

Rule. Multiply the principal by the given number of months, and divide the product by the rate for the time.

NOTE. The rate for the time is found by dividing 12 by the given rate per cent.

EXAMPLES.

34. What is the interest of $748 for 8 months at 6 per cent.?

6)12
2=rate for the time.

748=principal.
8=number of months.
2)59,84
29,92=interest 8 months.
Ans. $29,92.

35. What is the interest of $40 *a* 4 per cent. for 15 months? Ans. $2.

36. What is the interest of $874, *a* 5 per cent. for 9 months? Ans. $32,77,5.

NOTE. When 12 cannot be divided without a large decimal, it will be preferable to divide by the vulgar fraction, as in the following example.

37. What is the interest of $874 *a* 7 per cent. for 9 months?

7)12
$1\frac{5}{7}=\frac{12}{7}$.

874×9×7=55062÷12=45,88,5.
Ans. $45,88,5.

CASE VIII.

To find the interest for days at 6 *per cent.*

RULE. Multiply the principal by $\frac{1}{6}$ of the days, and cut off the right hand figure for a decimal, and proceed as in the general rule.

NOTE. This method of finding the interest by multiplying by $\frac{1}{6}$ of the days, is sufficiently exact for small sums; but for large sums the variation from the true answer will be more, which may be corrected by subtracting from the quotient $\frac{1}{7\frac{1}{3}}$ part of its amount.

EXAMPLES.

38. What is the interest of $94850 *a* 6 per cent. for 45 days?

6)45
$7\frac{3}{6}=7\frac{1}{2}$.

$\frac{1}{2}$)94850=principal.
$7\frac{1}{2}=\frac{1}{8}$ days.
663950
47425
$7\frac{1}{3}$)711,37,5=for 45 days.
9,74,4=$\frac{1}{7\frac{1}{3}}$ of quotient.
$701,63,1=true answer.

$711,37,5=interest for 45 days.
Ans. $701,63,1.

39. What is the interest of $874 for 120 days ?
Ans. $17,48.

40. What is the interest of $15 for 75 days ?
Ans. $0,18,7½.

Case IX.

To find the interest of any sum for any time, at 6 per cent.

Rule. Divide the given principal by 2 and the quotient will be the interest for one month ; multiply the interest for one month by the months in the given time, and point off as directed in the general rule.

Examples.

41. What is the interest of $748 for 8 months ?

2)748=principal.

$3,74=interest for one month.
8=number of months.

$29,92=interest for 8 months. Ans. $29,92.

42. What is the interest of $475,48,4 for 3 years and 4 months ?

2)475,48,4=principal.

2,37,7,42=interest for one month.
40=number of months in given time.

$95,09,6,80=interest for 3 years and 4 months.
Ans. $95,09,6.

43. What is the interest of $37 for 7 months ?
Ans. $1,29,5.

44. What is the interest of $95,24 for 11½ months ?
Ans. $5,47,6.

Case X.

When the principal is lawful money to find the interest in federal money, at 6 per cent.

Rule 1. Multiply the principal by 2, and cut off the right hand figure, for parts of a dollar. Or,

2. The shillings in the given pounds and shillings will be the interest in cents. Or,

3. Divide the given principal by 5.

EXAMPLE.

45. What is the interest of £225 in federal money?

Rule 1.	Rule 2.	Rule 3.
£225	£225	5)225
2	20	
$45,0	$45,00	$45.

Ans. $45.

CASE XI.

To find the interest on bonds, notes of hand, &c. when partial payments have been made, or endorsed on them.

RULE. 1. Find the interest of the given sum to the first payment, which either alone, or with any preceding payment, if any, exceeds the interest due at that time, and add that interest to the given sum.

2. From this amount subtract the payment made at that time with the preceding payments, if any, and the remainder will form a new principal; the interest of which find and subtract as of the first sum, and so on till the last payment.

NOTE. This mode of computing interest is established by law in Massachusetts for making up judgments on securities for money drawing interest, and on which partial payments are endorsed. This mode is the most equitable, because the payments are applied to keep down the interest, no part of which, in this method of computation, forms any part of the principal, drawing interest.

EXAMPLE.

For value received I promise to pay Mr. Thomas Borland, or order, twelve hundred dollars, with interest in six months from this date. January 1, 1816.

ANDREW DUNKIRK.

On the above note were the following endorsements; [illegible] 1, 1816, received $130. July 1, received $16. December 1, [illegible] $24. January 1, 1817, received $400. March 1, received $25. August 1, received $40. October 1, received $100. December 1, received $200. What remained due January 1, 1818?

The given sum bearing interest from Jan. 1, 1816 - -	$1200
Interest to May 1, 1816, to the first payment (4 mo.) -	24
Amount	$1224
May 1, paid a sum exceeding interest then due - - -	130
Remainder for a new principal - - - - - - - - -	$1094
Interest due on $1094 from May 1, to Jan. 1, 1817 (8 mo.)	43,76
Amount	$1137,76
Paid July 1, 1816, a sum less than int. then due $16	
Paid Decem. 1, 1816, a sum less than int. then due $24	
Paid Jan. 1, 1817 a sum exceeding int. then due $400	
	440
Remainder for a new principal - - - - - - - - -	$697,76
Interest on $697,76 from Jan. 1, 1817 to March 1 (2 mo.)	6,97,7
Amount	$704,73,7
Paid March 1, 1817, a sum exceeding int. then due	25
Remainder for a new principal - - - - - - - -	$679,73,7
Interest on $679,73,7 from March 1 to Aug. 1 (5 mo.)	16,99,3
Amount	$696,73
Paid Aug. 1, 1817, a sum exceeding int. then due - -	40
Remainder for a new principal - - - - - - - - -	$656,73
Interest on $656,73 from Aug. 1 to Oct. 1 (2 mo.)	6,56,7
Amount	$663,29,7
Paid Oct. 1, 1817, a sum exceeding int. then due - -	100
Remainder for a new principal - - - - - - - -	$563,29,7
Interest on $563,29,7 from Oct. 1 to Decem. 1 (2 mo.)	5,63,3
Amount	$568,93
Paid Decem. 1, a sum exceeding int. then due - - - -	200
Remainder for a new principal - - - - - - - - -	$368,93
Interest on $368,93 due Jan. 1, 1818 from Dec. 1, 1817	1,84,4
Balance due Jan. 1, 1818.	$370,77,4

Ans. $370,77,4.

SIMPLE INTEREST IN STERLING MONEY.

Case I.

To find the interest of any sum for a year.

General Rule.

Multiply the principal by the rate, and cut off two right hand figures; the left hand figures will be in the highest denomination given; the right hand figures must be reduced to the lowest denomination, each time cutting off the two right hand figures.

Note. When there are several years, multiply the interest of one year by the given number of years; and if parts of a year are given, as months and days, work by the aliquot parts which they make of a year or month, the sum of the quotients will be the answer.

Examples.

1. What is the interest of £394 at 6 per cent. per annum?

£394=principal.
6=rate.

£23,64=£23 12 9½ ⅖. Ans. £23 12 9½ ⅖.

2. What is the interest of £379 12 4½ *a* 5 per cent.? Ans. £18 19 7¼.

3. What is the interest of £434 for 3 years at 6 per cent. per annum? Ans. £78 2 4¾.

4. What is the interest of £994 10 4½ for 2 years and 9 months *a* 6 per cent. per annum? Ans. £164 1 10¾.

5. What is the interest of £978 at 3¾ per cent. for 2¼ years? Ans. £82 10 4½.

6. What is the interest of £84 10 for 7 months and 25 days *a* 6 per cent.? Ans. £3 6 2¼.

Case II.

To find the interest in federal money when the principal given is sterling, at 6 per cent.

Rule. Add one third to the principal, and multiply by 2, cut off one figure; the left hand figures will be dollars, the right hand figures parts of a dollar; or divide the sum by 5, or multiply it by 20 the product will be cents.

EXAMPLE.

7. What is the interest in federal money of £456 sterling?

3)456=sterling principal.
152=⅓ principal.

By rule 1.	By rule 2.	By rule 3.
608	608	5)608
2	20	
$121,60	$121,60	$121,60.

Ans. $121,60.

CASE III.

To find the interest for months at 6 per cent.

RULE. Multiply the principal by half the given number of months, and cut off as in the general rule.

EXAMPLES.

8. What is the interest of £454 at 6 per cent. for 10 months?

£454=principal.
5=½ number months.

22,70
20

14,00 Ans. £22 14.

9. What is the interest of £38 12 6½ for 11 months? Ans. £2 2 5¾.

CASE IV.

To find the interest for days.

RULE. Multiply the given principal by the given number of days and divide by 6083, for 6 per cent. (the number of days in which any sum will double itself at that rate) the quotient will be the answer.

NOTE. To find a divisor for any rate per cent. multiply 365 by 100 and divide the product by the given rate; thus, for 6 per cent. 365×100÷6=6083, ; for 5 per cent. 365×100÷5=7300; for 7 per cent. 365×100÷7=5214, &c.

EXAMPLE.

10. What is the interest of £28 for 210 days *a* 6 per ct.?

28×210=5880÷6083,=£0 19 3¾. Ans. £0 19 3¾.

COMMISSION.

FACTORAGE AND BROKERAGE,

ARE premiums, at so much per cent. allowed a person called a Correspondent, Factor or Broker, for assisting merchants, and others, in purchasing and selling goods.

RULE. Multiply the given sum by the rate per cent. and cut off the two right hand figures as in Simple Interest.

EXAMPLES.

1. What is the commission on the purchase of goods the invoice of which amounts to $870 at 2¾ per cent. ?

870×2¾=23,92,5. Ans. $23,92,5.

2. What is due to my Factor for selling goods, valued $1834 at 2½ per cent. ? Ans. $45,85.

3. What is the brokerage on £774 at 1½ per cent. ?

Ans. £11 12 2¼.

4. What must I allow my correspondent for selling goods to the amount of $48450 at 2½ per cent. ?

Ans. $1029,56,2½.

5. I remit to my correspondent $32840, with orders to purchase goods for my account; what is the amount of his commission at 2½ per cent. ? Ans. $800,97,5½.

$821,00

BUYING AND SELLING STOCKS.

STOCK is a fund established by government, or corporate bodies, the value of which is variable according to the exigency of the times. The practice of buying and selling sums of money in these funds is become common.

RULE. Multiply the sum to be purchased by the excess above 100, cut off two right hand figures, as in simple interest, which being added to the given sum will be the amount of the purchase required. If the value is under par, that is under 100, multiply by the rate per cent. and cut off as before directed.

EXAMPLES.

1. What is the purchase of $14820 bank stock of the United States, *a* 127½ per cent. ? Ans. $18895,50.

2. The 3 per cent. United States stock, owned by the city of New York, amounting to $840,000 has been disposed of at 68½ per cent. What was the amount of the purchase? Ans. $575400.

3. Manhattan Bank purchased New York state loan of $1,000,000 of six per cent. stock at 101¼ per cent.; what was the amount of the purchase? Ans. $1012500.

4. The three per cent. deferred stock was worth 69 per cent. in June 1818; what is the amount of $9745 at that rate? Ans. $6724,05.

ENSURANCE.

1. ENSURANCE, or ASSURANCE, is a premium at so much per cent. given for the security of making good the loss of ships, houses, goods, &c. which may happen by storms, fire, &c.

2. The amount ensured is called the principal.

3. The money paid for ensuring is called the premium.

4. The "average loss" is 10 per cent.; that is, if the owner of the property ensured suffer any loss or damage, not exceeding 10 per cent. he bears it himself, and the underwriter or ensurer is free.

5. The "Policy" is the instrument, by which the ensurers oblige themselves to make good the property ensured, in consideration of a certain premium, at a stipulated rate per cent.

CASE I.

To find the premium for ensuring any sum.

RULE. Multiply the given sum by the rate per cent. and cut off two right hand figures as in Simple Interest.

EXAMPLES.

1. What is the premium on the amount of a ship and cargo, valued $4844 *a* 3½ per cent.? Ans. $169,54.

2. What is the premium on a ship and cargo valued $19330 at 3¼ per cent. from Boston to London, and 2¾ per cent. from London to Boston? Ans. $1159,80.

Case II.

To find the sum for which a policy should be taken out to cover a given sum.

Rule. Subtract the premium from 100, and then say, by the Rule of Three,

As the remainder, is to 100;
So is the sum adventured, to the policy.

Or subtract the premium from 100; annex two ciphers to the sum to be covered, which divided by the remainder, the quotient will be the answer.

Example.

3. A merchant wishes to ensure his vessel and cargo, valued at $44350 on a voyage to the East Indies; for what sum must the policy be taken out to cover his property, at 10 per cent.?

100
10=premium per cent.

		$	$	$
Remainder	90 : 100 : :	44350 :	49277,77,77⅞.

Or 100
10

9,0)443500,0

49277,77,77⅞. Ans. Ans. $49277,77,77⅞.

Case III.

To find the premium, when a policy is taken out for a certain sum, to cover a given sum.

Rule. As the policy, is to the covered sum;
So is 100, to a fourth number, which
Subtracted from 100, the remainder will
be the premium.

Example.

4. If a policy is taken out for $49277,77,77⅞ to cover $44350 what is the premium per cent.?

49277,77,77⅞ : 44350 : : 100 : 90—100=10.

Ans. 10 per cent.

Case IV.

Having the policy for covering any sum and the premium given, to find the sum to be covered.

Rule. Subtract the premium from 100; multiply the policy by the remainder and cut off the two right hand figures, the left hand figures will be the sum to be covered.

EXAMPLE.

5. If a policy is filled for $49277,77,7⅞ at 10 per cent.; what is the sum to be covered?

100	49277,77,7⅞
10=premium.	90
90=remainder.	44350,00,00,0 Ans. $44350.

COMPOUND INTEREST.

COMPOUND INTEREST is that which arises from the principal and its simple interest, when due and forborn, reckoned together as a new sum; so that the principal and interest is always increasing.

RULE. Find the amount for the first year, and make it the principal for the second year; and so on for any number of years; subtract the given principal from the last amount, the remainder will be the compound interest.

EXAMPLES.

1. What is the compound interest of $744 forborn 4 years at 6 per cent. per annum?

$744=principal.	$835,95,84=prin. 3d. year.
6=rate per cent.	6
44,64=int. for 1 year.	50,15,7504=int. for 3d. yr.
744,..=given prin.	835,95,84..=last principal.
$788,64=amt. 1st. yr. & 6 prin. 2d. yr.	$886,11,5904=amt. 3d. yr. & 6 principal 4th.
47,31,84=int. 2d. yr.	53,16,695424=int. 4th yr.
788,64..=last prin.	886,11,5904..=last principal.
$835,95,84=amt. 2d. & prin. 3d. yr.	$939,28265824=amt. 4th. year.
	744.....=given principal.
	$195,28,2,65824=int. for 4 years.
	Ans. $195,28,2.

2. What is the compound interest of $840 for 3 years, at 5 per cent. per annum ? Ans. $132,40,5.

3. What is the amount of £256 10 for 7 years at 6 per cent. per annum com. inter. ? Ans. £385 13 7½.

A TABLE

Showing the amount of 1£ *or* 1$ *from* 1 *to* 10 *years, at* 4, 4½, 5, *and* 6 *per cent. per annum compound interest.*

Years.	4 *per cent.*	4½ *per cent.*	5 *per cent.*	6 *per cent.*
1	1,040000	1,045000	1,050000	1,060000
2	1,081600	1,092025	1,102500	1,123600
3	1,124864	1,141166	1,157625	1,191016
4	1,169859	1,192519	1,215506	1,262477
5	1,216653	1,246182	1,276282	1,338226
6	1,265319	1,302260	1,340096	1,418519
7	1,315932	1,360862	1,407100	1,503630
8	1,368569	1,422101	1,477455	1,593848
9	1,423312	1,486095	1,551328	1,689479
10	1,480244	1,552969	1,628895	1,790848

NOTE. The ratio, that is, the amount of 1$ or 1£ for one year, at any given rate is thus found;

RULE. As $100 : $104 :: $1 : 1,04 for the first year.
100 : 104 : : 1,04 : 1,0816 for the second year.
100 : 104 : : 1,0816 : 1,124864 for the third year; and so for any number of years, at any rate per cent.

EXAMPLES.

4. What is the amount of $225 for 3 years *a* 5 per cent. per annum, compound interest ?

225×1,157625=260,465625=Ans. $260,46,5.

5. What is the compound interest of $870 for 8 years *a* 6 per cent. per annum ?

1,593848×870=1386,647760—870=Ans. $516,64,7.

6. What is the amount of £845 12 for 9 years, at 4½ per cent. per annum compound interest ?

845,6×1,486095=1256,641932=£1256 12 10 Ans.

NOTE. The operation by the common rule to find the compound interest of any sum for several years being extremely laborious, the preceding table will greatly facilitate the work.

DISCOUNT.

DISCOUNT is an abatement of part of a sum of money, due some time hence, in consideration of prompt pay, or present payment of the remainder.

The sum paid is the *present worth*, which is such a sum, as, if put on interest, would in the same time and at the same rate, for which the discount is to be made, amount to the sum or debt then due.

CASE I.

To find the discount.

RULE. As 100 with its interest for the given rate & time,
Is to that interest;
So is the given sum,
To the discount required.

EXAMPLE.

1. What is the discount of $846 for six months at 6 per cent.?

100
6
mo. 6 | $\frac{1}{2}$)6,00
$3 : :

$ $ $ $
103 : 3 : : 846 : 24,64$\frac{8}{103}$.

Ans. $24,64.

NOTE. From the given sum $846
Subtract the discount 24,64$\frac{8}{103}$
Remains the present worth $821,35$\frac{95}{103}$.

CASE II.

To find the present worth.

RULE. As 100, with the interest for the given rate & time,
Is to 100;
So is the given sum, to the present worth.

EXAMPLE.

2. What is the present worth of $874 at 6 per cent. due 4 years hence?

100
6
6,00
4
24=Int. for 4 years.

$ $ $ $
124 : 100 : : 874 : 704,83,8 $\frac{22}{31}$.

Ans. $704,83,8$\frac{22}{31}$.

NOTE. From the given sum 874
Take the present worth 704,83,8$\frac{22}{31}$
Remains the discount $169,16,1$\frac{9}{31}$

NOTE 1. It is immaterial whether the present worth, or the discount is first found, for the difference between the debt and either of them will be the other.

2. The general practice among bankers in discounting bills is to find the interest of the sum drawn for, from the time the bill is discounted, to the time when it becomes due, including the days of grace; which interest is reckoned as the discount. This method, however, makes the Discount more than in justice it would be.

BANK DISCOUNT.

RULE. Multiply the given sum by $\frac{1}{6}$ of the days, including the days of grace, and cut off as directed in Case VIII. in Simple Interest, Federal Money.

EXAMPLES.

3. What is the discount of $11540 for 30 days?

11540
$5\frac{1}{2}$
57700
5770
$63,47,0

$\frac{1}{6}$)33=given days with grace.
$5\frac{1}{2}=\frac{1}{6}$ days and grace.

Ans. $63,47.

4. What is the discount of $12000 for 60 days?

$\frac{1}{6}$)63=given days with grace.
$10\frac{1}{2}=\frac{1}{6}$ days and grace.

12000
$10\frac{1}{2}$
120000
6000
$126,00,0

Ans. $126.

In the preceeding examples for 30 and 60 days, the 3 days of grace are added, making 33 and 63 days, which is the customary mode at the banks.

EQUATION OF PAYMENTS.

EQUATION OF PAYMENTS is finding a mean time for paying the whole debt, when several sums are due at different times.

RULE. Multiply each sum by its time of payment, and divide the sum of the products by the whole debt; the quotient will be the equated time.

EXAMPLES.

1. A owes B $2000, of which $500 is to be paid in 4 months; $600 in 5 months; $600 in 6 months; and $300 in 8 months; when must the whole be paid at one payment?

$500 \times 4 = 2000$
$600 \times 5 = 3000$
$600 \times 6 = 3600$
$300 \times 8 = 2400$

The whole debt 2,000)11,000=sums of products.

5½ mo. Ans. 5½ months.

2. A merchant bought goods to the value of $4000, to be paid as follows; viz. $1200 in 4 months; $800 in 6 months, and the remainder in 12 months; but afterwards agreed to pay the whole at one time; when must the debt be paid? Ans. 8 mo. 12 days.

3. A owes B $840 to be paid as follows: ⅓ in 3 months, ¼ in 4 months, and the rest in 6 months; at what time must the whole be paid at once? Ans. 4½ months.

BARTER.

BARTER is the exchanging of one commodity for another, and instructs traders so to proportion their goods of different kinds, value and quantities, that neither party may sustain loss.

Case I.

When the quantity and value of one article are given, to find how much of some other must be given for it.

Rule. Find the value of that article, whose price is given: then say, by the Rule of Three Direct,

As the price of the article required, per lb. or yd. &c.
Is to 1 lb. 1 yd. &c.;
So is the value of the given article,
To the quantity of the article required.

Examples.

1. Two merchants barter; A has 12 2 14lb. of sugar at $12 per cwt. which he wishes to exchange with B for cotton at 25 cents per lb.; how much cotton must B give A for his sugar?

qrs.	*cwt.*	
2	½	12
		144
14lb.	¼	6
		1,50

12=price 1 cwt. sugar.

c.	*lb.*	$.
As ,25	: 1 : :	151,50
		1

,25)151,50(606 lb.

$151,50=value of A's sugar.

B must give A 606lb. cotton for 12 2 14lb. sugar.
Ans. 606lb.

2. A has rum at $1,50 per gal. and B has 4 pipes of Madeira wine, containing 125 gallons each, at $3,50 per gal. how much of A's rum can B have for his wine?
Ans. 1166⅔ gals.

3. How much coffee, at 23 cents per lb. must be given in barter for 9 chests of tea, each weighing 95 lb. at $1,75 per lb.? Ans. 6505 6 15 17/23 drs.

Case II.

When a trader has goods at a certain price ready money, *but in barter advances the price.*

Rule. Find at what the other ought to rate his goods, in proportion to that advance price; then proceed as in Case I.

Note. The quantity of the latter commodity may be found either by the ready money or bartering price.

Examples.

4. A has raisins at 25 cents per lb. ready money, but in barter will have 30 cents per lb.; B has tea at $1,75 per

lb. ready money: what ought B to rate his tea at in barter, and what quantity of tea must be given for 20 boxes of A's raisins each weighing 35 lb.?

35 — 700*lb.*
20 — ,25 ready money price.

700=wt. of raisins. — 3500
,30=barter price. — 1400

$210,00=value of raisins, at bartering price. — $175,00=a lue at ready money.

	c.	*c.*	$.
As	,25	: ,30	: 1,75
			,30

,25)5250(2,10 B's bartering price.

	$	*lb.*		$.
As	2,10	: 1	: :	210,00
				1

2,10)210,00(100 lb. tea.

Or ready money price.

	$.	*lb.*	$.
As	1,75	: 1 :	175,00
			1

1,75)175,00(100 lb. tea as before.

Ans. { $2,10 B's barter price. / 100 lb. quantity of tea.

PROMISCUOUS QUESTIONS.

5. A trader has cinnamon at 30*d.* per lb. ready money, but in barter must have 36*d.* per lb.; B has nutmegs worth 7 6*d.* per lb. ready money; at how much must B rate his nutmegs per lb. that his profit may be equal to A's?

Ans. 9*s.*

6. Two traders barter; A has 120 cwt. sugar at $12 per cwt.; B has 256 yards broadcloth at $5 per yard; who must receive the difference, and how much?

Ans. $160 difference in favour of A.

7. A has 200 yards of broadcloth worth $2,50 per yard, for which B gives him $250 ready money, and 500 gallons of molasses; at what did B value his molasses per gallon?

Ans. 50 cents per gal.

8. A has 200 yards of broadcloth worth $2,50 per yard, for which B gives him $250 in cash, and the rest in molasses at 50 cents per gal.; how much molasses did B give A besides the cash? Ans. 500 gals.

9. A exchanges with B 40 lb. of indigo at $1 per lb. ready money, and $1,25 in barter, but is willing to lose 10 per cent. to have $\frac{1}{3}$ ready money; what is the ready money price of 1 yd. of cloth delivered by B at $3,50, to equal A's bartering price; and how many yards were delivered?

Ans. { $3,11,1$\frac{1}{9}$ ready money price of 1 yd.
{ 12$\frac{8}{9}$ yards delivered by B.

NOTE. The preceding may suffice to illustrate the most general cases in Barter. Other questions, however, which may not be contained in them, may be easily answered by a careful consideration of their nature.

LOSS AND GAIN.

LOSS AND GAIN is a rule, by which merchants and traders know what they gain in retailing goods, and in case of damage, what they lose by selling at any given rate; and whether they gain or lose, at what rate per cent.

The gain or loss is in proportion as the quantity of goods; therefore questions in this rule are answered by the Rule of Three Direct.

CASE I.

To know what is gained or lost per cent.

RULE. 1. See what the gain or loss is by Subtraction.
2. Say by the Rule of Three Direct,
As the price it cost,
Is to the gain or loss;
So is 100, to the gain or loss per cent.

EXAMPLES.

1. Wheat is bought at $1,25 and sold at $1,50 per bushel; what is the gain per cent.?

$1,50=price sold for.
1,25=price given.
,25=gain per bush.

$	c.	$
As 1,25	: ,25	: : 100,00

1,25)2500,00(20,00
Ans. 20 per cent.

2. How much per cent. profit, at 4s. on the pound?
Ans. 20 per cent.

3. How much per cent. profit, at 25 cents on the dollar?
Ans. 25 per cent.

Case II.

To know how an article must be sold to gain or lose so much per cent.?

Rule. By the Rule of Three, say,
As 100, is to the price;
So is 100, with the gain added, or loss subtracted,
To the gaining or losing price.

Examples.

4. If wheat is bought for $1,25 per bushel; how must it be sold to gain 20 per cent.?

$. $. $
100 : 1,25 : : 120
120

$1,50,00=selling price per bush. Ans. $1,50.

5. If goods worth $450 are shipped and come to a bad market; what will be the amount, if sold at 15 per cent. loss? Ans. $382,50.

6. Bought 150 yards cloth for £45; how must it be sold to gain 25 per cent.? Ans. £56 5.

Case III.

To know what an article cost, when there is gained or lost so much per cent.?

Rule. By the Rule of Three, say,
As 100 with the gain added, or loss subtracted,
Is to the price;
So is 100, to the prime cost.

Examples.

7. If wheat is sold for $1,50 per bush. and there is gained 20 per cent.; what did it cost per bushel?

100
20
120 : $ 1,50 : : $ 100
1,50
12,0)15,00,0
$1,25=prime cost. Ans. $1,25.

8. If goods are sold for $382,50; by which there is lost 15 per cent.; what was the first cost of them?

Ans. $450.

Case IV.

To know what would be gained or lost per cent. if goods, sold at such a rate, there is gained or lost so much per cent. if sold at another rate.

Rule. By the Rule of Three, say,
As the first price,
Is to 100, with the gain added or loss subtracted;
So is the other price,
To the gain or loss per cent. at the other rate.

Note. If the answer is 100, there is neither gain nor loss; the excess of 100 is gain; the deficiency of 100 is loss per cent.

Examples.

9. If wheat, sold at $1,50 per bushel, gain 20 per cent. what gain or loss per cent. will there be if sold at $1,25 per bushel?

	$.		$.		$.
As	1,50	:	120	: :	1,25
					120
					1,50)150,00
					$100

Ans. There is neither gain nor loss.

10. If, when tea is sold at $1,40 per lb. there is lost 30 per cent.; what is the gain or loss if it should be sold at $1,50? Ans. $25 loss.

EXCHANGE.

Exchange, considered as the subject of Arithmetic is the method of finding how much money in one country is equivalent to a given sum in another.

"*Par*" signifies equality; that is, when a sum of money in one country is of the same value, or contains the same quantity of pure gold or silver as a sum in another country; Exchange then is said to be *at par*.

"*The course of Exchange*" is the current price between two places, which is sometimes *above* and sometimes *below*

par, according to the circumstances of trade, or the demands of money. The course of Exchange between two nations is figurately speaking, a herald, which proclaims publicly the state of commerce and money negotiations betwixt them, and which of the two is indebted to the other.

Questions in Exchange are answered by the Rule of Three or Practice.

Rules for reducing the several currencies of the United States, also Canada and Nova-Scotia, to a *par* each with the other, have been given; see page 92–95.

The subsequent relate principally to foreign Exchange.

I. *GREAT-BRITAIN.*

Accounts are kept in Great-Britain and the West-Indies in pounds, shillings, pence and farthings.

4 6*d.* sterling is equal to one dollar federal money.

Case I.

To change pounds sterling to federal money.

Rule. To the sterling add $\frac{1}{3}$, to the sum annex three ciphers, divide by 3, and cut off the two right hand figures for cents, the figures on the left will be dollars.

Example.

1. In £126 sterling how many dollars?

$\frac{1}{3}$)126=sterling.
42

3)168000

$560,00 Ans. $560.

Case II.

To change pounds, shillings, pence and farthings sterling to dollars and cents.

Rule. Reduce the shillings, pence and farthings to the decimal of a pound by Case II. or III. in Decimal Fractions, annex it to the given pounds, add $\frac{1}{3}$ of the sum, divide by 3 and cut off two right hand figures, as before directed.

Example.

2. Reduce £246 18 4½ sterling to federal money.

$\frac{1}{3}$)246,919
82306

3)329225

$1097,41$\frac{1}{3}$ Ans. $1097,41$\frac{1}{3}$.

Case III.

To change dollars to sterling.

Rule. Multiply the dollars by 3, from the product subtract $\frac{1}{4}$, and from the remainder cut off the right hand figure for the decimal of a pound.

Example.

3. In $560 how many pounds sterling?

560=given dollars.
3

$\frac{1}{4}$)1660
420

£126,0 Ans. £126.

Case IV.

To change dollars and cents to pounds sterling.

Rule. Multiply the dollars and cents by 3, from the product subtract $\frac{1}{4}$, and from the remainder cut off the three right hand figures for decimals of a pound, the figures on the left will be pounds sterling.

Example.

4. Reduce $1097,41$\frac{2}{3}$ to sterling.
3

$\frac{1}{4}$)329225
82306,25

£246,91875=£246 18 4$\frac{1}{2}$. Ans. £246 18 4$\frac{1}{2}$.

II. *IRELAND.*

Accounts are kept in pounds, shillings, pence and farthings.

4 10$\frac{1}{2}$ qrs. Irish are equal to $1 Federal Money.

1 1*d.* Irish=1s. sterling; or £108 6 8 Irish=£100 sterling; therefore in reducing sterling to Irish at par $\frac{1}{1\frac{1}{2}}$ is added to Sterling; and $\frac{1}{1\frac{1}{3}}$ is subtracted from Irish to reduce it to Sterling Money at par.

Case I.

To reduce Irish to Federal Money.

Rule. From the Irish Money subtract $\frac{1}{1\frac{1}{3}}$, the remainder will be sterling, which reduce to Federal Money by case I. or II. Great-Britain.

EXAMPLE.

1. In £108 6 8 Irish how much federal money?

$\frac{1}{15}$)108 6 8=Irish.
8 6 8

$\frac{1}{3}$)100 0 0=sterling.
33 6 8

133 6 8=133,333+3=444,44$\frac{1}{3}$. Ans. $444,44$\frac{1}{3}$.

CASE II.

To change Federal Money to Irish.

RULE. Reduce the given sum to sterling, (by Case IV. Great-Britain,) to which add $\frac{1}{15}$, the sum will be Irish.

EXAMPLE.

2. In $444,44$\frac{1}{3}$ how much Irish money?

444,44$\frac{1}{3}$=federal.
3

$\frac{1}{3}$)133333
33333

$\frac{1}{15}$)100,000=sterling.
8 6 8

£108 6 8=Irish. Ans. £108 6 8.

III. *HAMBURGH.*

In Hamburgh accounts are kept either in Pounds, Schillings, and Groats Flemish; or in Marks, Schillings Lubs, or Stivers, and Phinnings or Deniers.

12 phinnings, or deniers, or 2 groats=1 schilling-lub, or stiver=1 1-8 penny sterling.
16 schillings-lubs, or stivers, or 32 groats=1 mark=1 6*d*. sterling.
2 marks . . . . . 1 dollar=3*s*. sterl.
3 marks . . . . . 1 rix doll.=4 6*d*. ster.=1$ federal money.
7$\frac{1}{2}$ marks . . . . . 1 pound Flemish.
32 Flemish pence . . . . . 1 mark.

ALSO,

12 groats or pence Flemish . . . . . 1 schilling Flemish.
20 schillings Flemish . . . . . 1 pound.
The mark banco=33 1-3 cents by the laws of United States.

NOTE. The current money of Hamburgh is of less value than that of the Bank. This difference is called the "agio," which is variable, but always in favor of the bank.

100 lb. in Hamburgh = 107¼ lb. in the United States.
100 ells . . . . = 62½ yards.

Case I.

To reduce Marks to Federal Money.

Rule. Divide the given sum by 3.

Examples.

1. Reduce 155442 marks to dollars and cents, at 33⅓ cts. per mark.

33⅓=⅓ of a dol. 3)155442=marks.

$51814=dollars.

Ans. $51814.

2. In 8456 marks 8 stivers; how many dollars and cts.?

3)8456=marks.

2818,66⅔

,16⅔=8 stivers.

$2818,83⅓ Ans. $2818,83⅓.

Case II.

To reduce Federal Money to Marks.

Rule. Multiply the dollars by 3, the product will be marks. If dollars and cents are given, multiply by 3, cut off two right hand figures, for decimals of a mark, which being reduced will give the stivers and deniers.

Example.

3. Reduce $2818,83⅓ to marks and stivers.

$2818,83⅓

3

Marks 8456,50

16 stivers = mark.

300

50

Stivers 8,00 Ans. 8456 marks 8 stivers.

Case III.

To reduce Hamburgh to Sterling Money.

Rule. Divide the given sum by the rate of Exchange, and the quotient will be Sterling.

EXAMPLE.

4. How much sterling will a bill on Hamburgh, amounting to 6609 marks 6 stivers, be worth, Exchange at 35 3*d* per pound sterling?

35 3*d*. 6609 marks 6 stivers.
12 32=marks 2
423 13218 12 groats.
19827
12=6 stivers.

423)211500(500 £. sterling.
2115 Ans. £. 500.
00

CASE. IV.

To reduce Sterling Money to Hamburgh currency.

RULE. Multiply the sterling by the rate of exchange, and the product will be the answer in the same denomination to which the exchange was reduced.

EXAMPLE.

5. How many marks should be received at Hamburgh, for £.500 sterling, exchange at 35 3*d*. per pound sterling?

35 3 423
12 500
423=groats 2)211500=groats.
16)105750=stivers.
marks 6609,6 Ans. 6609 marks, 6 stivers.

NOTE. To reduce current to bank money; say, as 100 with the agio added, is to 100 bank: so is the current money to the bank money required. Also to reduce bank into current money; say, as 100 is to 100 with the agio added: so is the bank money given, to the current required.

IV. *HOLLAND.*

In Holland there are two banks, the one of Amsterdam and the other of Rotterdam. The bank of Amsterdam is the most famous and considerable in Europe. It was established in 1609, by the authority of the States General, under the direction of the Burgomasters of the city, who, having constituted themselves the perpetual cashiers of the merchants of Amsterdam, are themselves a security for the bank,

Various opinions have been formed respecting the real sum of money deposited in this bank, but very few have estimated it under 30 millions sterling.

It is to this bank the city of Amsterdam owes its splendor and magnificence, which though it possesses the greatest part of the merchants ready money, rather promotes than interrupts their commerce, by the security and dispatch with which a bank credit is attended; for as business in the bank is negotiated by transfers, millions may be paid in a day, without the intervention of any cash, which is of the greatest consequence in expediting trade that can possibly be imagined.*

In Holland, Flanders and Germany, accounts are kept in Pounds, Schillings and Pence Flemish, divided as the British pound; but they are kept more generally in Guilders or Florins, Stivers, Deniers or Phinnings.

				s.	d.	
8 Phinnings	. . make	. 1 Groat.	. .			
2 Groats, or 16 phinnings	.	1 Stiver	. .	=0	$1\frac{1}{6}$	sterling.
20 Stivers, or 40 groats	. . .	1 Guilder, or florin		=1	9 ,86	ster.
12 Groats, or 6 stivers	. . .	1 Schilling	. .	=0	6 ,56	
20 Schillings, or 6 guil. or florins		1 Pound Flemish		=10	11 ,18	
$2\frac{1}{2}$ Guilders	. . . . .	1 Rix Dollar	.	=4	6 ,66	

The guilder or florin of the United Netherlands is equal to 40 cents in the United States, or 2 cents per stiver.

100 lb. in Amsterdam = $109\frac{1}{2}$ lb. in the United States.

100 ells = 75 yds. in the United States.

Britain exchanges with Holland on the pound sterling, which is estimated *a* £.1 16 6 Flemish.

Case I.

To reduce Dutch money, that is, Guilders or Florins to Federal money.

Rule. **Multiply the guilders or florins by 40, the product will be the cents.**

Examples.

1. In 2480 guilders, how much Federal money, at 40 cents exchange per guilder?

2480 = guilders.
40 = exchange.

$992,00 **Ans $992**

* Jackson.

2. Remitted from Amsterdam to Boston a bill of 1855 guilders 13 stivers; how many dollars and cents, exchange at 40 cents per guilder?

1855 = guilders.
40

74200
26

$742,26

13 = stivers.
2

26 = cents.

Ans. $742,26.

Case II.

To reduce Federal Money to Guilders or Florins, &c.

Rule. Divide the dollars and cents by 40, the quotient will be guilders; and half the remainder will be the stivers.

Examples.

3. In $992,00 how many guilders?

4,0)992,0,0

2480 = guilders.

Ans. 2480 guilders.

4. In $742,26 how many guilders?

4,0)742,2,6

1855,26 = 1855 guilders 13 stivers.

Ans. 1855 guil. 13 stivers.

Case III.

To reduce Flemish to Sterling.

Rule. Divide the given sum by the rate of exchange.

Example.

5. A merchant at Amsterdam remits £876 10 10 Flemish, to be paid at London; for how much sterling money must he draw, the exchange being *a* 33 6*d.* Flemish per pound sterling?

33 6*d.*
12

402

876 10 10
20

17530
12

402)210360(523 6 $2\frac{2}{67}$ sterling.

Ans. £.523 6 $2\frac{2}{67}$.

Case IV.

To reduce Sterling to Flemish money.

Rule. Multiply the sterling by the rate of exchange, dividing the product by £.1 if necessary.

Example.

6. Remitted from London to Amsterdam a bill of £ 523 6 $2\frac{2}{67}$ sterling; to how many pounds Flemish will it amount, exchange 33 6*d.* Flemish per pound sterling?

523 6 $2\frac{2}{67}$ × 402 ÷ 1608 = 210370 pence = £.876 10 10.

33 6*d.*	£.1
12	20
402	20
	12
	240
	67
	1680
	1440
	16080

Ans. £.876 10 10 Flem.

V. *FRANCE.*

Paris and Bourdeaux are the principal places of exchange in France; where the business of exchange is particularly studied.

Accounts are kept throughout the French dominions in Livres, Sols and Deniers, divided as the British Pound. In exchange with France, England pays so many pence sterling for their *crown*, or *ecu* of 3 livres, or 60 sols tournois = 4 6*d.* sterling, exchange at par.

12 Deniers = 1 Sol.
20 Sols = 1 Livre.
3 Livres = 1 Crown.

The Livre tournois is = to $18\frac{1}{2}$ cents in the United States.

Case I.

To reduce Livres to Federal money.

Rule. Multiply the livres by $18\frac{1}{2}$, or rate of exchange, and the product will be cents. If sols are given with

livres, reduce them to the decimal of a livre; multiply as before, and the product will be mills.

EXAMPLES.

1. Reduce 8440 livres to dollars and cents.

8440=livres.
$18\frac{1}{2}$=value of 1 livre.

67520
8440
4220=$\frac{1}{2}$ cent.

$1561,40

Ans. $1561,40.

2. My correspondent writes me, advising of the safe arrival of the brig Huntress at Bourdeaux, and that he had received in good condition the goods shipped and consigned to him for my account; that the net proceeds, after deducting freight, duties, commission, &c.; amounted to 74101 livres 10 sols, exchange at 20 cents per livre; with what sum in Federal money must I debit his account?

71101,5 =livres and sols.
20=rate of exchange.

$14820,30,0 Ans. $14820,30.

CASE II.

To reduce Federal Money to Livres.

RULE. Divide the given sum by $18\frac{1}{2}$ or the rate of exchange, the quotient will be the answer.

EXAMPLES.

3. Reduce $1561,40 to livres.

18,5)1561,40,0(8440

Ans. 8440 livres.

NOTE. To change French to Sterling, say, As one crown is to the given rate of exchange; so is the French sum to the Sterling money; also, To change Sterling to French, say, As the rate of exchange, is to one crown, so is the Sterling to the French money.

VI. *SPAIN.*

The monies in Spain are of two sorts; the one is called *plate money*, by which is understood, *silver money*; the other is called *vellon.*

Foreign bankers or remitters at Madrid, Cadiz, Seville, &c. keep their accounts in piastres, rials and mervadies, reekoning 34 mervadies to a rial, and 8 rials to a piastre, the par of which is 3 7*d.* sterling.

The shop-keeper at Madrid, the custom-house, and other dealers within the kingdom keep their accounts in rials and mervadies vellon.

The doubloon of exchange is equal to 4 piastres or 32 rials.

Accounts also are kept in dollars, rials and mervadies, and exchange by the piece of eight = 4 6*d.* at par.

34 mervadies = 1 rial.
8 rials . = 1 piastre or piece of eight.
10 rials . = 1 dollar.

The rial plate is = 10 cents, and the rial vellon 5 cents in the United States; therefore,

To reduce Rials Plate and Rials Vellon to Federal Money.

Rule. Multiply the rials plate by 10, and the rials vellon by 5, the product will be the answer.

Examples.

1. Reduce 8474 rials plate to dollars and cents.

8474
10

$847,40 Ans. $847,40

2. Reduce 8354 rials vellon to dollars and cents.

8354
5

$417,70 Ans. $417,70.

London remits to Cadiz £.874 12 4 sterling, exchange at 37$\frac{7}{8}$*d.* per piastre; how much will be received for this remittance at Cadiz?

37$\frac{7}{8}$ 874 12 4×8÷303=5542,1254=
8 5542 piastres 1 rial Ans.

303

VII. *PORTUGAL.*

Accounts are kept at Oporto and Lisbon in reas and exchange on the milrea=5 7½ sterling, at par, or $1,25 in the United States. 1000 reas=1 milrea.

Case I.

To change Milreas and Reas to Federal Money.

Rule. Multiply the given sum by 1,25 and cut off three right hand figures for decimals of a cent; or add ¼ to the given sum and the answer will be dollars and parts of a dollar.

Example.

1. My correspondent at Oporto advises of the sales of goods shipped and consigned to him, the net proceeds, after deducting commissions, duties, &c. amounted to 14637 milreas, 800 reas, exchange at $1,25; how much must he be debited?

14637,800		Or ¼)14637,800	
1,25		3659450	
73189000		$18297,25,0 as before.	
292756			
146378			
$18297,25,000		Ans. $18297,25.	

Case II.

To reduce Federal Money to Milreas.

Rule. Subtract ¼ from the federal money carrying the division to three places from the dollars, the remainder will be milreas and reas.

Example.

2. Reduce $18297,25 to milreas, *a* $1,25 per milrea.

¼)18297,25,0	
3659450	
14637,800	Ans. 14637 milreas, 800 reas.

VIII. *DENMARK.*

Accounts are kept at Denmark in Current Dollars and Skillings reckoning 96 skillings to the dollar. The rix dollar is=$1 in the United States.

To change Danish to Federal Money.

RULE. The rix dollars being equal to Federal Dollars, therefore find the value of the parts, and annex it to the dollars.

EXAMPLE.

In 14786 rix dollars and 50 skillings how many dollars and cents, exchange 100 cents per rix dollar?

14786,50
96

300
450

$14786,48,00 Ans. $14786,48.

IX. *EAST-INDIA MONEY.*

1. BENGAL.

Accounts are kept at Madras in Pagodas, Fanams, and Cash.

80 cash=1 Fanam.
36 Fanams=1 Pagoda.
1 Pagoda=$1,94 in the United States.

To change Pagodas into Federal Money.

RULE. Multiply by 1,94.

2. CALCUTTA.

Accounts are kept in Rupees, Annas, and Pice.
12 pice=1 anna.
16 annas=1 rupee.
The rupee of Bengal=55½ cents in the United States.

To change Rupees to Federal Money.

RULE. Multiply by 55½.

3. CHINA.

Accounts are kept in Tales, Mace, Candareens and Cash.
10 cash . . . =1 candareen.
10 candareens . =1 mace.
10 mace . . . =1 tale, which is equal to $1,48 in the United States.

To change Tales to Federal Money.

RULE. **Multiply tales by 1,48.**

NOTE. Those who wish to acquire a more particular knowledge of Foreign Exchange may find a very extensive and excellent treatise on the subject, in "Walsh's Mercantile Arithmetic."

CONJOINED PROPORTION.

CONJOINED PROPORTION **is when the coins, weights and measures of several countries are compared in the same question, and discovers their relation, one to another.**

CASE I.

When it is required to find how many of the first sort of coin, weight or measure, given in the question, are equal to a given quantity of the last.

RULE. **1. Place the numbers alternately, beginning at the left hand, and let the last number stand on the left hand.**

2. Multiply the first column continually for a dividend, and the second for a divisor.

PROOF. **Make as many statements in the Rule of Three Direct as the question requires.**

EXAMPLES.

1. If $4 are worth 40s. and 30s. 6 crowns, and 120 crowns, worth £30, and £42 40 guineas, how many dollars are equal to 1300 guineas?

Left. Right.
$4=40*s*. Left $4\times30\times120\times42\times1300=786240000$=dividend.
s. 30=6 *cro*. Right $40\times6\times30\times40=288000$=divisor.
cro. 120=30£
£. 42=40 *guin*. And 7862400000÷288000=2730 dolls.
guin. 1300=$ Ans. $2730.

CASE II.

When it is required to find how many of the last sort of coin, weight or measure, given in the question, are equal to a quantity of the first.

RULE. **1. Place the numbers alternately, beginning at the left hand, and let the last given number stand on the right.**

2. Multiply the first column continually together for a divisor, and the second for a dividend.

EXAMPLE.

2. If 20lb. at Boston are equal to 18lb. at Rotterdam; 180lb. at Rotterdam, 224lb. at Versailles; how many pounds at Versailles are equal to 100lb. at Boston?

Left.

Boston 20=18 Rotterdam. *Left* 20×180=3600=divisor.
Rotterdam 180=224 Versailles. *Right* 18×224×100=403200=div.
Boston 100. And 403200÷3600=112lb. Ans. 112 lb.

ARBITRATION OF EXCHANGES.

ARBITRATION OF EXCHANGES means a method of choosing the best way of remitting money abroad, with the greatest advantage.

It is by comparing the *par of Exchange*, already found, with the *present course of Exchange*, that the best way to remit, or draw, to most advantage can be determined. It is performed by Conjoined Proportion.

EXAMPLES.

My Correspondent at Rotterdam has $3500, which he can remit by way of Oporto, at 840 reas per dollar, from Oporto to Boston at 8 2*d.* per milrea (or 1000 reas);—Or he can remit by way of Rochelle at 5⅝ livres per dollar, and from Rochelle to Boston at 6 8*d.* per crown; which circular remittance is the most advantageous, and what is the difference?

First.

$1 at Rotterdam=840 reas at Oporto.
Reas 1000 at Oporto . =98*d.* at Boston.
1000×1=1000 divisor. $3500 at Rotterdam.
840×98×3500=288120000=dividend.
288120000÷1000=288120 pence.

12 | 288120
6 | 24010 shillings.

$4001,66,6⅔ by way of Oporto.

Secondly.

$1 at Rotterdam=$5\frac{2}{5}$ livres at Rochelle.
Livres 6 at Rochelle=80*d.* at Boston.
$1\times6=6$=divisor. $3500 at Rochelle.
$80\times5\frac{2}{3}\times3500=1512000$=dividend.
$1512000\div6=252000$ pence.

12 | 252000
6 | 21000 shillings.

$3500 by way of Rochelle; consequently the remittance by way of Oporto is most advantageous, making the difference of $501,66,6$\frac{2}{3}$ Ans.

The difference of the remittance wholly depends on the *Course of Exchange* at the time; an extensive correspondence therefore, is absolutely necessary to acquire a thorough knowledge of the *Course of Exchange* to make this kind of remittance profitable.

INVOLUTION.

INVOLUTION is the finding of powers.

If a number is continually multiplied by itself, the several products are called "powers" of that number; thus, 2 : 4 : 8 : 16 : 32 : 64 : 128 are powers of the number 2.

NOTE. These powers exist in nature, viz. a root is represented by a line or side having only one distention, viz. *length*; the square is a plain figure of two dimensions, viz. *length* and *breadth*! the cube has three dimensions, viz. *length*, *breadth* and *thickness*. All the superior powers have no existence in nature, but are composed of a multiplication of any number four or more times into itself. So, $2\times2\times2\times2\times2=32$, the sursolid or 5th power, whose root is 2, has no existence in nature, but may be understood as a series of numbers in geometrical progression.

Powers are numbered 1st, 2d, 3d, 4th, &c. and sometimes are called the square, cube, biquadrate, &c.

The figures, used to distinguish one power from another, are called *indices* and *exponents*, and are placed at the top on the right hand; thus, 3^2, 4^3;

Thus are $3^1 : 9^2 : 27^3 : 81^4$ $\left\{\begin{matrix}\text{indices}\\\text{powers}\end{matrix}\right\}$ of the number 3.

To raise a number to any power.

RULE. Multiply the given number by itself continually, until the number of products is as many, except one, as the index of the power to be found.

1. What is the square, or second power, of 21?
   $21 \times 21 = 441$ = square of 21. Ans. 441.
2. What is the cube of 4?
   $4 \times 4 \times 4 = 64$ = cube or third power. Ans. 64.
3. What is the biquadrate or fourth power of 9?
   $9 \times 9 \times 9 \times 9 = 6561$. Ans. 6561.
4. What is the fourth power of 1,05?
   Ans. 1,21550625.

To raise Vulgar Fractions to any power.

RULE. Raise both of the terms of the fraction to the power required, as before directed.

If a mixt number is proposed, either reduce it to an improper fraction and work as before, or reduce the vulgar fraction to a decimal, and proceed as in the whole numbers.

EXAMPLES.

5. Raise $\frac{4}{5}$ to the fourth power.
   Numer. $5 \times 5 \times 5 \times 5 = 625$
   Denom. $8 \times 8 \times 8 \times 8 = 4096$ Ans. $\frac{625}{4096}$.
6. What is the square of $4\frac{2}{5}$? Ans. $4\frac{84}{25}$ or 19,36 decimal.

NOTE. In a series of powers, the *sum* of any two indices is the index of a power, which is the product of the two powers whose indices were added. And the *difference* of any two indices is the index of a power, which is the quotient of the two powers whose indices were subtracted. Hence any power, above the third, may be easily found without producing all the lower powers.

Thus to find the 7th power of any number, because 4 and 3 make 7, multiply the 4th power, by the 3d, the product will be the 7th power. Again, multiply the 7th power by the 5th the product will be the 12th power, because 7 and 5 added are equal to 12, and so for any other.

EVOLUTION.

EVOLUTION is the finding of the root of any number.

The index of the root, like that of the power in Involution, is one more than the number of multiplications, necessary to produce the power, or given number.

Note 1. Roots are sometimes denoted by this character $\surd$ before the power with the index of the root against it; thus, $\surd^3 64$ signifies the third root or cube of 64.

2. There will always be as many figures in the root as there are periods in the given power.

To extract the square root is to find out such a number, as, being multiplied into itself, will produce the given number.

SQUARE ROOT.

General Rule.

1. Point the given number, beginning at the right hand, into periods of two figures each.

2. Find the greatest square in the first or left hand period, and place it under this period, and its root in the quotient; subtract the square number from the first period, and to the remainder bring down the next period and call this the *Resolvend.*

3. Double the quotient for a divisor.

4. Find how often the divisor is contained in the *Resolvend*, omitting the unit figure, and place the answer in the quotient and at the right hand of the divisor.

5. Multiply this divisor by the last quotient figure and subtract the product from the *Resolvend*; to the remainder bring down the next period, and proceed as before, till all the periods are brought down; the figures in the quotient will be the root.

Proof. Multiply the quotient, or root, by itself, adding the remainder, if any, the sum will be equal to the given number or power. This method of proof will apply to the roots of any power.

Examples.

What is the square root of 1522756?

1522756 (1234=square root.

Divisors 1

Double the quot.=22)52=resolvend.

44

Double the quot.=243)827=resolvend.

729

Double the quot.=2464)9856=resolvend.

9856

0

Ans. 1234.

2. What is the square root of 83521 ? Ans 289.
3. What is the square root of 5499025 ? Ans. 2345.

NOTE. If, after all the periods are used, there is a remainder, the given number is not a square number, and therefore has no exact integral root; but it is a *surd*, that is, a number whose root can never be exactly found, but may be approximated by annexing ciphers continually to the remainder in periods of two each, and the quotient will be the answer, giving as many whole numbers in the root as there are periods of whole numbers, and as many decimals as there are periods of decimals.

EXAMPLE.

4. What is the square root of 7 ?

$7,0\dot{0}\dot{0}\dot{0}\dot{0}\dot{0}$ divided by the general rule = Ans. 2,645†.

NOTE. When the given number consists of a whole number and decimals together, make the number of decimals even by annexing ciphers to them, so that a point may fall on the unit's place of the whole number, and proceed as directed in the General Rule.

EXAMPLES.

5. What is the square root of 234,723 ?

$\dot{2}\dot{3}\dot{4},7230$ which divided by the general rule will give 15,32† Ans.

6. What is the square root of ,00032754 ?
Ans. ,01809†.

To extract the Square Root of a Vulgar Fraction.

RULE. 1. Reduce the fraction to its lowest terms.
2. Extract the square root of the numerator for a new numerator, and the square root of the denominator for a new denominator. But if the fraction is a *surd*, that is, a number whose root cannot be exactly found, reduce it to a decimal and extract its root as directed in the general rule.

EXAMPLES.

7. What is the square root of $\frac{4}{9}$?
$\frac{4}{9}=\frac{2}{3}$. Ans. $\frac{2}{3}$.
8. What is the square root of $\frac{0216}{12544}$? Ans. $\frac{6}{7}$.
9. What is the square root of the surd $\frac{275}{341}$?
$\frac{275}{341}=,8064516129$†. $\sqrt{,8064516129}=,89802$† Ans.

To extract the Square Root of a mixed number.

RULE. 1. Reduce the fractional part to its lowest terms, and the mixt number to an improper fraction.

2. Extract the root of the numerator and denominator for a new numerator and denominator.

If the mixt number is a *surd*, reduce the fractional part to a decimal, annex it to the whole number, and extract its square root.

EXAMPLES.

10. What is the square root of $51\frac{1}{4}$?

$51\frac{1}{4}=\frac{205}{4}$ and $\sqrt{\frac{205}{4}}=\frac{15}{2}=7\frac{1}{2}$. Ans. $7\frac{1}{2}$.

11. What is the square root of $27\frac{9}{16}$? Ans. $5\frac{1}{4}$.

12. What is the square root of the surd $6\frac{2}{3}$?

$6\frac{2}{3}=6{,}666666\dagger$. And $\sqrt{6{,}666666}=2{,}581\dagger$.

Ans. $2{,}581\dagger$.

13. A general has an army composed of 103041 men, and wishes to form them into a square; how many must be placed in rank and file? Ans. 321.

CUBE ROOT.

To extract the Cube Root of any number.

RULE. 1. Point the given number, beginning at the right hand, into periods of three figures each.

2. Find the greatest cube of the first period and subtract it from the first period; put this root in the quotient, and to the remainder bring down the next period and call it the *resolvend*.

3. Square the quotient and multiply it by 3 for a *divisor*.

4. Find how often the divisor is contained in the *resolvend*, rejecting the units and tens, and put the answer in the quotient.

5. Square the last figure in the quotient, and place it on the right hand of the divisor, always putting a cipher in the place of tens, when the quotient figure is less than four.

6. Multiply the last figure in the quotient by 3 and its product by the preceding figure in the quotient; place it

under the last divisor, putting units under tens; add them together and multiply their sum by the last quotient figure for the subtrahend, which subtract from the *resolvend*, bring down the next period, and proceed as before.

EXAMPLES.

1. What is the cube root of 1860367?

Square of 1×3 = 3=divisor. 1860867(123
Square of 2 put to 3=304 1
2×3×1= 6
860=resolvend
364×2=subtrahend. 728
132867=resol.

Square of 12×3=432=divisor.
Square of 3 put to 43209
3×3×12=108
44289×3=subtrahend 132867
0

2. What is the cube root of 94818816? Ans. 456.
3. What is the cube root of 382657176? Ans. 726.
4. What is the cube root of 12812904? Ans. 234.

To extract the Cube Root of a Vulgar Fraction.

RULE. 1. Reduce the fraction to its lowest terms, and extract the cube root of its numerator and denominator. If the fraction is a *surd*, reduce it to a decimal and extract its root.

NOTE. In pointing for decimals, begin at the left hand and make the first three figures, next to the decimal point, the first period; and if the period on the left is not complete, make it up with ciphers. This must be observed both in pure fractions and mixt numbers.

EXAMPLES.

5. What is the cube root of $\frac{324}{1500}$? Ans. $\frac{3}{5}$.
6. What is the cube root of $1\frac{1}{2}$? Ans. 1,1447.
7. What is the cube root of the surd $\frac{2}{3}$? Ans. 873†.

To extract the Biquadrate Root.

RULE. Find the square root of the given number, and extract the square of that square root.

EXAMPLES.

1. What is the biquadrate root of 228886641 ?
Ans. 123.

2. What is the biquadrate root of 43237380096 ?
Ans. 456.

NOTE. Although the rules may be given for reducing the roots of higher powers, they are scarcely worth the pupil's labor, as their operations are very tedious, and seldom necessary; and when they do occur, the work may be easily performed by logarithms.

To extract Roots by Logarithms.

RULE. Divide the given number by the index of the given power, whose root is to be extracted, the quotient will be the logarithm of the root; that is, divide by 2 for the square root; 3 for the cube; 4 for the biquadrate; 5 for the sursolid or fifth power, &c.

EXAMPLE.

1. What is the sursolid or 5 power of 31,25 ?
The logarithm of 31,25=1,4948500
One fifth, is the logarithm of the root 1,990, &c.
=0,2989700 Ans.

General Rule for extracting Roots of all powers.

RULE. 1. Prepare the given number for extraction, as the root requires.

2. Find the first figure in the root, and subtract its power from the given number, and to the remainder bring down the first figure of the next period and call it the *dividend.*

3. Involve the root already found to the power next inferior to that which is given, and multiply it by the number denoting the given power for a *divisor.*

4. Find how often the divisor may be had in the *dividend*, and the quotient will be another figure of the root.

5. Involve the whole root to the given power, and subtract it from the given number, as before.

6. Bring down the first figure of the next period to the remainder for a *dividend*, to which find a *new divisor*, and so continue till the whole is finished.

EXAMPLES.

1. What is the cube root of 30959144 ? Ans. 314.
2. What is the biquadrate root of 1664966416 ?
Ans. 202.

ARITHMETICAL PROGRESSION.

ARITHMETICAL PROGRESSION is a series of numbers increasing or decreasing by a common difference, or by a continual addition or subtraction of some equal numbers.

There are five things in Arithmetical Progression, any three of which being given, the other two may be found.

1. The first term, } called the extremes.
2. The last term, }
3. The number of terms.
4. The common difference.
5. The sum of all the terms.

NOTE. 1. If any three numbers are in Arithmetical Progression, the sum of the two extremes will be equal to double the mean or middle number; thus, 4 . 9 . 14 . that is, 4+14=18=9×2=18.

2. If four numbers are in Arithmetical Progression, the sum of the two extremes will be equal to the sum of the two means or middle numbers; thus, 2 . 5 . 8 . 11 . that is, 2+11=13=5+8=13.

3. If many numbers are in Arithmetical Progression, the sum of the two extremes will be equal to the sum of any two means that are equally distant from the extremes; thus,

5 . 8 . 11 . 14 . 17 . 20; 5+20=25=8+17=25=11+14=25.

4. If the numbers are odd, the sum of the two extremes will be equal to the sum of any two means equally distant from them, and all be equal to double the odd mean or middle number; thus, 3 . 7 . 11 . 15 . 19 . 23 . 27; 3+27=30=7+23=30=11+19=30=15×2=30.

PROPORTION I.

The two extremes and number of terms being given, to find the common difference.

RULE. Subtract the less from the greater extreme, and divide the remainder by the number of terms, less one, the quotient will be the common difference.

EXAMPLES.

1. What is the common difference of 11 terms of an arithmetical series, whose extremes are 3 and 33?

33—3=30÷11—1=3 com. diff. Ans. 3.

2. There are 8 children that differ alike in their ages,

the youngest is 2 years old, and the eldest 23 ; what is the difference of their ages, and the age of each ?

23—2=21÷8—1=3 com. diff. of their ages.

Youngest	2	4th . .	14
7th . . .	5	3d . .	17
6th . . .	8 } years old.	2d . .	20 } years old.
5th . .	11	Eldest	23

PROPORTION II.

The two extremes and the number of terms being given, to find the sum of all the terms.

RULE. Multiply the sum of the two extremes by half the number of terms, the product will be the sum of all the terms.

EXAMPLES.

3. What is the sum of an Arithmetical Progression, whose extremes are 3 and 33, and number of terms 11 ?

3+33=36×5½=198=sum of all the series. Ans. 198.

4. How many times does a clock strike in 12 hours ?

12+1=13×6=78. Ans. 78.

PROPOSITION III.

The two extremes and common difference being given, to find the number of terms.

RULE. Subtract the less from the greater extreme, and divide the remainder by the common difference, the quotient plus one will be the number of terms.

EXAMPLES.

5. The two extremes are 3 and 33, and the common difference 3 ; what is the number of terms ?

33—3=30÷3=10+1=11=number of terms Ans.

6. A man starting from Boston to travel to a certain place, his first day's journey was 6 miles, and his last was 40 miles ; he increased his travelling each day 4 miles ; how many days did he travel ?

40—6=34÷4=8½+1=9½. Ans. 9½ days.

PROPOSITION IV.

Either of the extremes, the number of terms, and common difference being given, to find the other extreme.

RULE. Multiply the common difference into the number of terms minus one, subtract the product from the greater extreme, the remainder will be the less extreme ; or add the less extreme to that product the sum will be the greater extreme.

EXAMPLES.

7. The less extreme is 3, the greater 33, the number of terms 11, and the common difference 3; either extreme is required. $3\times10=30-33=3$ less extreme. And $3\times10=30+3=33$=greater extreme. Ans. 3 and 33.

8. A man in 7 days travelled from Boston to New-York, he increased each day's journey by 3 miles, his last day's journey was 45 miles; what was the first day's journey, and how many miles did he travel?

Number of terms $7-1=6\times3=18-45=27=1$st days jour'y.

By proposition II. $27+45=72\times3\frac{1}{2}=252$=number miles.

Ans. { 27 miles. Distance 252 miles.

GEOMETRICAL PROGRESSION.

GEOMETRICAL PROGRESSION is when any series of numbers increase by one common multiplier, or decrease by one common divisor; as, 2 : 4 : 8 : 16 : 32; here 2 is the common multiplier. And 64 : 32 : 16 : 8 : 4 : 2; here 2 is the common divisor.

NOTE. The common multiplier, or divisor, is called the *ratio*.

In any Geometrical Progression the same things are to be observed as in Arithmetical Progression, viz.

1. The extremes, or first and last terms.
2. The number of terms.
3. The ratio, or common multiplier or divisor.
4. The sum of all the series; any three of which being known, the others may be found.

NOTE. 1. If any three numbers are in Geometrical Progression, the product of the two extremes will be equal to the square of the mean or middle number, thus, 4 . 8 . 16; $4\times16=64=8\times8=64$.

2. If four numbers are in Geometrical Progression, the product of the two extremes will be equal to the product of the two means or middle numbers; thus, 81 . 27 . 9 . 3; $81\times3=243=27\times9=243$.

3. If many numbers are in Geometrical Progression, the product of the two extremes will be equal to the product of any two means that are equally distant from them; thus, 2 . 4 . 8 . 16 . 32 . 64; $2\times64=128=4\times32=128=8\times16=128$.

4. If the numbers are odd, the product of any two extremes will be equal to the square of the mean; thus, 2 . 4 . 8 . 16 . 32; $2\times32=64=4\times16=64=8\times8=64$.

Proposition I.

The two extremes and common ratio being given, to find the sum of all the series.

Rule. Multiply the greater extreme by the common ratio, subtract the less extreme from the product, and divide the remainder by the common ratio minus one, the quotient will be the series.

Examples.

1. What is the sum of a geometrical series, whose extremes are 2 and 4374 and the common ratio 3?

$4374 \times 3 = 13122 - 2 = 13120 \div 3 - 1 = 6560$ Ans.

2. A gentleman marrying, received from his father-in-law one dollar, on condition, that he was to receive a present on the first day of every month for the first year, which should be double still to what he had the month before; what was the lady's fortune? Ans. $4095.

Proposition II.

The less extreme, common ratio, and number of terms being given, to find the greater extreme.

Rule. Raise the ratio to a power denoted by the number of terms minus one, and multiply that power by the less extreme, the product will be the greater extreme.

Examples.

3. The less extreme is 4, the common ratio 2, and number of terms 10; what is the greater extreme?

$2^9 \times 4 = 2048 =$ greater extreme. Ans. 2048.

4. What debt will be discharged in 12 months by paying $1 the first month, $2 the second, each month paying double to the preceding payment, and what will be the last payment? $2^{11} = 2048 \times 2 - 1 = 2048$ last payment.

By propo. I. $2048 \times 2 = 4096 - 1 = \$4095 =$ the debt.

Proposition III.

The greater extreme, common ratio, and number of terms being given, to find the less extreme.

Rule. Raise the ratio to a power denoted by the number of terms minus one, and divide the greater extreme by that power, the quotient will be the less extreme.

EXAMPLE.

5. The greater extreme is 2048, the common ratio 2, and the number of terms 10; what is the less extreme?

$2^9=512\div2048=4$ less extreme. Ans. 4.

PROPOSITION IV.

The two extremes and common ratio being given, to find the number of terms.

RULE. Divide the greater extreme by the less, and raise the ratio to a power equal to the quotient, add one to the index of that power, and the sum will be the number of terms.

EXAMPLES.

6. The two extremes are 4 and 2048, the common ratio 2; what is the number of terms?

$2048\div4=512$. $2^9=512$. Therefore $9+1=10$ Ans.

7. In what time will a debt be discharged by monthly payments, the first of which is $1 and the last $2048, the ratio being 2?

$2048\div1=2048$. $2^{11}=2048$. Therefore $11+1=12$ mo. Ans.

PROPOSITION V.

The two extremes and number of terms being given, to find the common ratio.

RULE. Divide the greater by the less extreme, and extract that root of the quotient, whose index is denoted by the number of terms minus one, the root will be the common ratio.

EXAMPLES.

8. The two extremes are 4 and 2048, and the number of terms 10; what is the common ratio?

$2048\div4=512$. Therefore $512^9=2$ com. ratio.

Or $512^3(8^3=2$ com. ratio Ans.

9. What will be the ratio of the series in discharging a debt in a year by monthly payments, the first payment of which is $1 and the last $2048?

$2048\div1=2048$. Therefore $2048^{11}=2$ common ratio.

POSITION.

NEGATIVE ARITHMETIC, called the Rule of False, is that, by which a true number is found out by supposed numbers.

Position is either Single or Double.

SINGLE POSITION.

RULE. Suppose any number at pleasure, and work it according to the nature of the question. If the result fully agrees with the conditions of the question, the work is done, and the number supposed will be the answer; but if not, proceed thus,

As the result of the supposition,
Is to the number supposed;
So is the given number in the question,
To the true number, or answer.

EXAMPLES.

1. A gentleman had a certain number of dollars in his purse, the sum of the third, fourth and sixth part of them made 54; how many were in the purse?

60=supposed number.
20=$\frac{1}{3}$ of the supposed numb.
15=$\frac{1}{4}$ ditto.
10=$\frac{1}{6}$ ditto.
45=sum of supposition.

Proof

3	72
4	24
6	18
	12
	54

Then, as 45 : 60 : : 54

54
240
300
45)3240(72 dolls.

Ans. $72.

2. Three persons conversing about their ages, said the first, I am so old; said the second, I am as old again as that; and said the third, I am as old as the first and half as old as the second; their ages taken together make 108 years; what is the age of each?

Ans. { First $21\frac{3}{5}$. Second $43\frac{1}{5}$. Third $43\frac{1}{5}$.

DOUBLE POSITION.

DOUBLE POSITION requires two suppositions, which must be used according to the nature of the question. If either of the suppositions answer the question, the work is done, but if not, observe the following rule.

RULE. Compare the conditions of the question, with the results of the suppositions, and find whether each supposition is greater or less than the true answer; if greater mark the excess with +, if less, with —, and set down both suppositions and their errors with the signs opposite to them; then say,

As the difference of the errors, if alike, or sum, if unlike,
Is to the difference of the suppositions;
So is either error,
To a fourth number;

which, being added to or subtracted (as the case may require) from the supposition, opposite to the error which is used, will be the true answer.

EXAMPLES.

1. A person, being asked the age of each of his sons, replied, that his eldest son was 4 years older than the second; his second 4 years older than the third; his third son 4 years older than the fourth, or youngest; and his youngest son was half the age of the oldest; what was the age of each of his sons?

First.

	sup.	*error.*
Suppose the youngest 8 years then would the ages of the other three be 12, 16, and 20.	8	—2
	18	+ 3
Half of 20=10 and 10—8=2=the first error, and less.	10	5

Secondly.

Suppose the youngest 13 years, then would the other three be 22, 26 and 30.

Half of 30=15 and 18—15=3 second error, and more.

As 5 : 10 : : 2 : 4+8=12.

Or 5 : 10 : : 3 : 6—18=12=the age of the youngest, and the ages of the other three are 16, 20, 24, Ans.

2. A boy, stealing apples, was taken by the owner, and, to appease his anger, gave him half of what he had, and the owner gave him back 10; going a little further, he met a man and was compelled to give him half of what he had left, who returned him back 4; going further he met another person at whom he gave half of what he then had, and who gave him back 1; at length getting safe away, he found, that he had 13 left; how many had he at first?

Ans. 60.

ALLIGATION.

By the rule of Alligation, questions, relating to the mixing of different simples, are resolved. It is either Medial or Alternate.

ALLIGATION MEDIAL

Is when there are given the quantities and prices of the several simples to be mixt, to find the price of some quantity of the mixture.

Rule. Find the values of all the given quantities of the simples to be mixt, at the given prices, and then say,

As the sum of the quantities to be mixt,
Is to the sum of their values;
So is that *part*, or *quantity* of the mixture whose price is sought, To its value.

Example.

A grocer, wishing to mix currants, takes 18lb. at 5 cents, 30lb. *a* 6 cents, and 12lb. *a* 8 cents per lb.; what is the value of 1lb. of the mixture?

18lb.	*a* 5c. =	90
30	. . 6c. =	180
12	. . 8c. =	96
60lb.	.	$3,66

lb. $ *lb.*
As 60 : 3,66 :: 1 : 6,1m. Ans.

ALLIGATION ALTERNATE.

Alligation Alternate admits of several cases, but it is of very little use in business.

Rule. Take the difference between each price, and the mean rate, and set them alternately, they will be the answer; which will be as various as the different modes of linking them together.

Example.

How much tea *a* 16*s*. 14*s*. 9*s*. and 8*s*. per lb. will compose a mixture worth 10*s*. per lb.?

10*s*. { 8—, 9—, 14—, 16— } 6 *a* 8*s*. 4 *a* 9*s*. 1 *a* 14*s*. 2 *a* 16*s*.

Or thus 10*s*. { 8—, 9—, 14—, 16— } 4 *a* 8*s*. 6 *a* 9*s*. 2 *a* 14*s*. 1 *a* 16*s*.

Ans. 4lb. *a* 8*s*. 6 *a* 9*s*. 2 *a* 14*s*. and 1lb. *a* 16*s*.

PERMUTATION AND COMBINATION OF [illegible]M-BERS.

By the Combination of numbers is meant the different orders, into which any number of things can be disposed, either by Permutations, Elections, or Compositions.

Case I.

To find the number of changes any number of things undergo.

Rule. Assume the natural series of numbers, 1, 2, 3, &c. up to the given number of things, and multiply them continually into one another, the last product will be the answer.

Example.

How many changes can the three first letters of the alphabet undergo?

$1\times2\times3=6$ Ans.

Proof.

1. a b c.	4. b c a.
2 a c b.	5. c b a.
3. b a c.	6. c a b.

Case II.

To find the number of Elections of a less number of things from a greater number.

Rule. Take the natural order of series 1, 2, 3, &c. up to the number to be elected, and multiply them continually together; then take a series of as many terms, decreasing by one, down from the number out of which the elections are to be made, and multiply the terms of it continually together; divide the latter product by the former, the quotient will be the answer.

Example.

How many choices of 2 are there in six different things?

Suppose a b c d e f, the things proposed.

$1\times2=2.$
$6\times5=30.$
$30\div2=15$ Ans.

The elections are

ab, ac, ad, ae, af,=5
bc, bd, be, bf,=4
cd, ce, cf,=3
de, df,=2
ef,=1

15

Case III.

To find the number of Compositions of any number of things in an equal number of sets, the things being all different.

Rule. Multiply the things in every set into one another continually, the product will be the answer.

Example.

Suppose 4 companies, each consisting of 10 men, how many compositions of 10 men each can be drawn out from them.

$10\times10\times10\times10=10000$. Ans. 10000.

Application of the preceding cases.

1. Five travellers came to a public house, and agreed with the landlord to stay with him, as long as they with him could sit in a different position every day at dinner; how long must they stay to fulfil the agreement? 725

Ans. 720 days.

2. A butcher, wishing to buy some sheep, asked the owner how much he must give him for 20; on hearing his price, he said it was too much; the owner replied, that he should have 20, provided he would give him a cent for each different choice of 10 in 20, to which he agreed; how much did he pay for the 10 sheep, according to the bargain? Ans. $1847,56.

3. How many changes are there in throwing 6 dice?

Ans. 46656.

4. How many changes can be rung on the 8 bells belonging to Christ Church in Boston, and how long will all the changes take in ringing once over, allowing 8 changes to be rung in a minute.

Ans. { 40320 changes. / 3 days, 11 hours.

5. Two gamesters one day, at dice they would play,
And being full merry in wine,
Says B. unto A. what odds will you lay,
I cast not *all the six* faces this time?
Says A. then to B. ten to one I'll lay thee,
With six dice the six faces you cast not.
Pray, gentlemen, shew, and soon let them know,
For the odds on the cast, Sirs, they know not.

Ans. A.'s chance to that of B. is as 459[illegible] to 7290, or as 6,38 to 1.

SIMPLE INTEREST BY DECIMALS.

NOTE. 1. Let P = the Principal, or sum put to interest.
R = the Ratio, or rate per cent.
T = the Time.
A = the Amount.
I = the Interest.

2. The ratio is the simple interest of $1 or £.1 for one year at the rate per cent. proposed, and is thus found;

ratios.

As 100 : 4 : : 1 : ,04 = rate at 4 per cent.
100 : 4,5 : : 1 : ,045 = . . 4½ per cent.
100 : 6 : : 1 : ,06 = . . 6 per cent.

3. All the various cases which can possibly take place in Simple Interest, may be expressed by five theorems, which will be annexed to each case.

4. When two or more letters are joined together like a word, they are to be multiplied continually together.

5. When shillings, pence and farthings are given, they must be reduced to the decimal of a pound by Cases II. or III. in Decimals, page 82. When cents and mills are given, there is no need of reduction, as they are in their nature the decimals of a dollar.

CASE I.

When the principal, time, and ratio are given, to find the Interest.

RULE. **Multiply the principal, time and ratio together, the last product will be the answer. Or the proposition and rule are more concisely expressed thus, prt. = I.**

EXAMPLES.

1. What is the interest of £.945 10 for 3 years at 5 per cent. per annum?

945,5=principal.
,05=ratio.

47,275
3

£.141,825=£.141 16 6.

Ans. £.141 16 6.

NOTE. When the interest is for any number of days only; multiply the interest of $1 or £.1 for one day at the given rate, by the principal and given number of days, the last product will be the answer.

Table of Interest for $1 or £.1 for one day.

Per ct.	Decimals.	Per ct.	Decimals.
3	,00008219178	5	,00013698730
3½	,00009589041	6	,00016438356
4	,00010958904	7	,00019178082
4½	,00012328767	8	,00021917808

The preceding table is thus made;

	days.		*day.*	
As	365	:	1	: ,00016438356
	365	:	1	: ,00021917808, &c.

2. What is the interest of $240 for 120 days at 4 per cent. per annum?

,00010958904×240×120=,003,15,6,16435200.
Ans. $3,15,6.

Case II.

When the principal, rate, and time are given, to find the amount.

Rule. Multiply the principal, rate, and time together, the last product will be the interest, to which add the principal, and the sum will be the amount. Or, prt.+p.=A.

Example.

3. What is the amount of $279,50 for 7 years at 4½ per cent. per annum?

279,50×,045×7=88,04250+279,50=$367,54,2½. Ans.

Note. When there is any odd time given with whole years, reduce the odd time into days, and work with the decimal parts of a year which are equal to those days.

4. What will £273 18 amount to in 4 years, 175 days, at 3 per cent. per annum?

Ans. £310 14 1¾,335080064 qrs.

Table of the decimal parts of a year, equal to any number of days, and quarters of a year.

Days.	Decimals.	Days.	Decimals.	Days.	Decimals.
1	,002740	10	,027397	100	,273973
2	,005480	20	,054794	200	,547945
3	,008220	30	,082192	300	,821918
4	,010959	40	,109589	365	1,000000
5	,013698	50	,136986		
6	,016438	60	,164383	¼ year	=,25
7	,019178	70	,191781	½ . .	= ,5
8	,021918	80	,219178	¾ . .	=,75
9	,024657	90	,246575		

Case III.

When the amount, rate, and time are given, to find the principal.

Rule. Multiply the rate by the time, add unity to the product, for a *divisor*, by which divide the amount, the quotient will be the principal. Or, $\frac{a.}{rt+1.}=P.$

Examples.

5. What principal put to interest will amount to $36 7 ,54,2½ in 7 years at 4½ per cent. per annum?

,045×7=,315+1=1,315=divisor.
367,54,2½÷1,315=279,5=$279,50 Ans.

6. What principal will amount to £310 14 1 3,35080064 qrs. in 4 years, 175 days, at 3 per cent. per annum?

Ans. £273 18.

Case IV.

When the amount, principal, and time are given, to find the rate.

Rule. Subtract the principal from the amount, divide the remainder by the product of the time and principal, the quotient will be the rate. Or $\frac{a.-p.}{rt.}=R.$

EXAMPLE.

7. At what rate per cent. will $279,50 amount to $367,54,2½ in 7 years?

367,54,2½—279,50=88,04,2½

279,50×7=1956,50=divisor.

88,04,25÷1956,50=045=4½ Ans.

CASE V.

When the amount, principal, and rate per cent. are given, to find the time.

RULE. Subtract the principal from the amount, divide the remainder by the product of the rate and principal. Or, $\frac{a.-p.}{pr.}$ T.

EXAMPLE.

8. In what time will $279,50 amount to $367,54,2½ at 4½ per cent.?

367,54,25—279,50=88,04,25=dividend.

279,50×,045=12,5775=divisor.

88,04,25÷12,5775=7 years. Ans. 7 years.

COMPOUND INTEREST BY DECIMALS.

Let A=the Amount.
P= Principal.
T= Time.
R= Ratio, that is, the amount of $1 or £.1 for a year, at any given rate.

NOTE. For rules to find the ratio, also a table showing the amount of $1 or £.1 from 1 to 10 years, at 4, 4½, 5 and 6 per cent. per annum, with rules for its construction, see Compound Interest, page 151.

CASE I.

When the principal, time, and ratio are given, to find the amount.

RULE. Raise the ratio to a power, denoted by the given number of years, by which multiply the principal, and

the product will be the amount, from which subtract the principal, the remainder will be the Compound Interest. Or $p.\times r^t.=A.$

EXAMPLE.

1. What is the amount of $225 for 3 years at 5 per cent. per annum?

$1,05\times1,05\times1,05=1,157625\times225=260,465625.$

Ans. $260,46,5.

NOTE. The raising of the ratio to a power, denoted by the number of years given in the question, being extremely tedious, the table, alluded to above, will greatly facilitate the operations in Compound Interest by Decimals.

CASE II.

When the amount, rate, and time are given, to find the principal.

RULE. Divide the amount by the product of the ratio, raised to a power, denoted by the given number of years, the quotient will be the principal. Or $\frac{a.}{r^t.}=P.$

EXAMPLE.

2. What principal, being put to interest, will amount to $260,46,5,625 in 3 years, at 5 per cent. per annum?

$1,05\times1,05\times1,05=1,157625=$divisor.

$260,46,5,625\div1,157625=225.$ Ans. $225.

CASE III.

When the principal, amount, and time are given, to find the ratio, or rate per cent.

RULE. Divide the amount by the principal, the quotient will be the ratio raised to a power, denoted by the given time; find the root of this power, and it will be the ratio. Or $\frac{a}{p}=r^t.$ which, being extracted by the rule in Evolution, will be the ratio.

EXAMPLE.

3. At what rate per cent. per annum, will $225 amount to $260,46,5,625 in 3 years?

260,46,5,625÷225=1,157625, the cube root of which, it being the 3d power, denoted by the 3 years, gives 1,05=5.

Ans. 5.

Case IV.

When the principal, amount, and rate are given, to find the time.

Rule. Divide the amount by the principal, the quotient will be the ratio, raised to a power denoted by the given number of years, which being continually divided by the ratio till nothing remains, the number of these divisions will be the time. Or $\frac{a}{p}=r^t$. which must be divided according to the rule.

Example.

4. In what time will $225 amount to $260,46,5,625 at 5 per cent. ?

260,46,5,625÷225=1,157625.

1,157625÷1,05=1,1025÷1,05=105÷1,05=1,05.

The number of divisions being three gives 3 years.

Ans. 3 years.

A

SHORT AND PLAIN

SYSTEM

OF

BOOK-KEEPING,

BY

SINGLE ENTRY;

CALCULATED FOR THE USE OF

RETAILERS, MECHANICS AND FARMERS.

BOSTON, SEPTEMBER, 1818.

BOOK-KEEPING.

BOOK-KEEPING is the art of recording mercantile transactions.

Two methods have been generally adopted, *viz;*

1. Single entry.
2. Double entry, commonly called the Italian method.

The method by single entry is used principally by traders in retail business, and is calculated to answer all the purposes of the mechanic and farmer, that a just and exact state of their less extensive pecuniary concerns may at any time be known.

As this method is by much the more concise and simple, it will be explained first, that the scholar may have a distinct view of the subject, and be better prepared to commence the more complicated and perfect method by double entry.

Single entry requires two principal books, *viz;*

1. The Waste, or Day-Book.
2. The Leger.

NOTE. There are several other books used by Merchants, for a description of which, see Double entry.

The form of the Waste-Book.

This book is ruled with two columns on the right-hand for dollars and cents, and one column on the left for inserting the folio of the Leger, to which the account is transferred. It is ruled with a top line, on which is written the month, date and year.

The articles are separated from each other by a line, and the transactions of one day from those of another by a double line, in the centre of which is the day of the month.

For a better description of the Waste-Book, see the specimen annexed.

The use of the Waste-Book.

This book commences with an inventory, containing all the ready money, notes, goods, and every other kind of property, owned by the merchant; also all the debts due by him to others. Then follows a particular detail of every transaction in trade, by which new debts are contracted, or former ones discharged; the whole related in a concise and simple style, in the order of time, in which they occur, with the quantities and prices of the goods, purchased or sold, with every circumstance, necessary to render the transaction so plain and intelligible, that satisfactory information may be readily given to any interested inquirer.

It is of the greatest importance, then, that the Waste-Book be kept with particular accuracy, as it contains all the materials composing the Leger. Moreover, in cases of disputed accounts, this book is exhibited to judges, and referees for inspection, that they may ascertain the correctness of the entry, as well as the nature of the demand, and be enabled to form an equitable decision between the parties.

In entering an article in the Waste-Book, the following circumstances should be carefully observed; *viz.*

1. The date, and on the top of each page, the merchant's place of residence.
2. The person with the title Dr. or Cr. annexed, as he may become Dr. or Cr. in the transaction.*
3. The part of the transaction which belongs to the merchant.
4. The terms of payment.
5. The quantity, quality, mark, &c. of the article.
6. The price.
7. The amount, in the money columns.
8. The folio, or page, to which the article is refered in the Leger.

In the Waste-Book, the name of the person, with whom the merchant has dealings, is written over the account in a large round hand, or text, with the term *Dr.* annexed when *he receives* any thing, but with the term *Cr.* when *he* (the customer) *pays, gives or parts* with any thing.

The titles of Dr and Cr. may be easily distinguished by the following rules: *viz.*

* The term "transaction" is applied to all mercantile business.

1. The person to whom goods are sold on credit, is *Dr. to* the goods expressing the quantity and price. See Day-Book, January 12, James Munson, &c.

2. The person, of whom goods are bought on credit, is *Cr. by* the goods, expressing the quantity and price. See Day-Book, January 22, Rufus Perkins, Cr. &c.

3. The person, to whom money is paid, is *Dr.* to cash, mentioning whether in full or in part. See Day-Book, January 31 and April 27, Amos Penniman, Dr.

4. The person, from whom money is received is *Cr.* by cash, mentioning whether in full, or in part. See Day-Book, January 25 and March 4, John Grant, Cr.

5. The person, to whom the merchant, in any way becomes indebted, is entered *Cr.*

6. The person, who in any way becomes indebted to the merchant, is entered *Dr.*

7. The Receiver is *Dr.* and the Giver is *Cr.*

8. *In Dr. Out Cr.*—The initials of which form the word Idoc, which may assist the scholar's memory.

THE LEGER.

The Leger is the merchant's principal book, as in it are collected the scattered accounts of the Waste-book, and disposed in spaces assigned for them; each with the Debtor placed on one side of the folio, and the Creditor of the same account on the opposite side of the same folio, by which disposition the several transactions, connected with each account, appear together at one view.

The form of the Leger.

Each folio, or page of the Leger is ruled with a top line, on which is written the title of the account, and marked *Dr.* on the left-hand, for receiving all the debited articles, and on the right *Cr.* for receiving all the credited articles of the Waste-book. On the right hand of both Dr. and Cr. sides are ruled two columns for dollars and cents; one column for the folio of the Waste-book, and two on the left-hand margin for the month and date.

The Leger has an index, in which the titles of the accounts are arranged under their initial letters, with the number of the folio in the Leger, where the account may be found.

Rule for Posting the Leger.

Enter the several transactions on the Dr. or Cr. side in the Leger, as they stand debited or credited in the Day-book.

Note. When several persons or things are included in the same transaction, they are distinguished by the term, "Sundries."

Balancing Accounts.

When all the transactions are correctly posted into the Leger, each account is balanced by subtracting the less side from the greater, entering the balance on the less side, by which both sides will be made equal. The balances being added to the cash on hand and the value of the goods unsold, the sum is the net of the estate, which compared with the stock at commencing business exhibits the profit and loss.

Note. When the place assigned for any person's account is filled with items, the person's name must not be entered a second time, but may be transferred to another page in the following manner, viz. Add up the columns on both sides, and against the sum write, "Amount transferred to folio —" inserting the number of the folio where the new account is opened. After titling the new account and entering the number of the folio in the index, write on the Dr. side of the new account, "To amount brought from folio —" inserting the number of the folio from which the old account was brought, and on the Cr. side "By amount brought from folio —" inserting also the folio where the old account was; and place the sums in the proper columns. See the accounts of Trask folio 2 and 3.

* When the first Leger is filled up, a new one may be opened as follows, viz. At the end of the preceding Leger, draw out a balance account, entering the debits and credits on their respective Dr. and Cr. side and transfer each unbalanced account to its respective Dr. or Cr. side to the new Leger. The first Leger may be marked A, the second B, and so on in alphabetical order.

Boston, January 1, 1817.

L. F.		$.	C.
	Inventory of ready money, goods, and debts due to Aaron Richardson, merchant, Boston.		
	Money on hand $740		
3	John Grant owes me 140		
2	Thomas Moore 175		
4	William Young 224		
	75 yards broadcloth *a* 3$ . . . 225		
	121¼ yards of linen *a* ,75 . . 91,31		
	20 cwt. sugar *a* $10,75 . . . 215		
	800 lb. coffee *a* ,20 160		
		1970	31
	"—		
	List of debts owed by the said Aaron Richardson.		
2	To Thomas Andrews, as per account . $320		
3	Amos Penniman 78		
2	James Trask 132		
		530	
	— 5 —		
1	**David Eaton, Dr.**		
	To 5 yards broadcloth . . . *a* $4,25		
	6 do. linen . . . . . *a* ,80		
	20 lb. coffee . . . . . *a* ,29		
		31	85
	— 12 —		
1	**James Munson, Dr.**		
	To 8 yards broadcloth . . . *a* $4,25		
	2 cwt. sugar . . . . *a* 12,75		
	30 lb. coffee . . . . . *a* ,29		
		68	20
	— 15 —		
2	**Thomas Andrews. Dr.**		
	To Cash, paid him in part 140		
	— 22 —		
3	**Rufus Perkins, Cr.**		
	By 3 chests hyson tea containing 230lb. net, *a* $1,20		
	3 do. bohea tea containing 270lb. net *a* ,75		
		478	50

N. B. By single entry goods bought are entered either in an invoice book, kept for that purpose, or posted immediately into the Leger, from the invoices or bills of parcels. This mode, however, is not adopted here, but credited the seller at the time, and afterwards transferred to his account in the Leger.

Boston, January 25, 1817.

L. F.		$.	C.
3	**John Grant, Cr.**		
	By Cash received from him in part . .	32	
	28		
3	**James Anderson, Dr.**		
	To 6 yards linen . . . . . *a* ,80		
	20 lb. coffee . . . . . *a* ,29		
		10	60
	31		
3	**Amos Penniman, Dr.**		
	To Cash, paid him in part	40	
	February 3		
1	**Joseph Hurd, Dr.**		
	To 25lb. hyson tea . . . . *a* $1,40		
	2½ yards broadcloth . . . . *a* 4,75		
	14 lb. sugar . . . . . *a* ,16		
		49	11
	6		
1	**Benjamin Gould, Dr.**		
	To 40 lb. bohea tea . . . . . *a* ,85		
	12 lb. hyson . . . . . *a* $1,40		
	50 lb. coffee . . . . . *a* ,29		
		65	30
	10		
1	**Jonathan May, Cr.**		
	By 1 hhd. molasses, containing 110 gallons *a* ,45		
	1 pipe of gin, containing 124 gallons *a* $1,75		
	20 quintals fish . . . . . *a* 3,25		
		331	50
	15		
2	**Thomas Chandler, Cr.**		
	By 2 boxes candles, containing 90lb. . *a* ,19		
	80 lb. mould do. . . . . *a* ,25		
		37	10
	20		
2	**Thomas Moore, Cr.**		
	By Cash received from him in full . . .	175	
	25		
1	**David Eaton, Dr.**		
	To 75 lb. coffee . . . . . *a* ,28		
	3 14 lb. sugar . . . *a* $1[illegible]		
		31	94

Boston, February 28, 1817.

L. F.		$.	C.
1	**David Eaton, Cr.**		
	By Cash, in part on account	25	
	March 4		
3	**John Grant, Cr.**		
	By Cash, received from him in full . . .	108	
	8		
2	**James Dean, Dr.**		
	To 8 lb. candles . . . . . *a* ,22		
	12 lb. coffee . . . . . *a* ,29		
	7 lb. sugar $1		
		6	24
	12		
4	**William Greenwood, Dr.**		
	To 24 lb. coffee . . . . . *a* ,29		
	3½ lb. bohea tea . . . . . *a* ,36		
	10 lb. candles . . . . . *a* ,22		
		12	17
	18		
2	**James Trask, Dr.**		
	To Cash, paid him in full	132	
	27		
3	**Rufus Perkins, Dr.**		
	To 12 yards broadcloth . . . *a* $4,75		
	cash, paid him on account . . *a* $149		
		206	
	31		
4	**Jonathan Boylston, Dr.**		
	To 42 lb. sugar . . . . *a* ,15		
	34 lb. coffee . . . . *a* ,29		
	13¾ lb. bohea tea . . . *a* ,35		
	8 gals. gin . . . . *a* $2,25		
		45	85
	April 7		
3	**John Grant, Dr.**		
	To 14 lb. sugar . . . . *a* ,15		
	10¼ gallons molasses . . . *a* ,55		
	4 gals. gin . . . . *a* $2,25		
	[illegible] . . . *a* ,22		
		17	62
	10		
4	**William Greenwood, Cr.**		
	By Cash, received from him on account .	10	

Boston, April 15, 1817.

L. F.		$.	C.
2	**James Trask, Cr.**		
	By 1 hhd. rum, containing 117 gals. *a* ,95		
	1 pipe brandy, containing 126 gals. *a* $2,10		
	1 pipe Madeira wine, cont'g. 132 gals. *a* 3		
		771	75
	18		
4	**William Bradley, Cr.**		
	By 124 gallons winter strained oil . *a* ,95	117	80
	20		
4	**William Young, Cr.**		
	By Cash, received from him in full . . .	224	
	24		
2	**Thomas Andrews, Dr.**		
	To Cash paid him in full	180	
	27		
3	**Amos Penniman, Dr.**		
	To Cash, paid him in full	38	
	30		
3	**James Anderson, Dr.**		
	To 10 gals. oil $1,10		
	8 yds. broadcloth . . . . *a* ,75		
	24 lb. coffee . . . . . *a* ,29		
	1¼ quintal fish . . . . *a* $5		
		62	21
	May 2		
1	**David Eaton, Cr.**		
	By Cash, received from him on account . .	30	
	5		
1	**James Munson, Cr.**		
	By Cash, received from him on account .	55	
	8		
3	**Rufus Perkins, Dr.**		
	To 15¾ yds. linen . . . . . *a* ,95		
	28 lb. cheese . . . . . *a* ,20		
	Cash, paid him on account . . $250		
		60	56
	12		
3	**James Anderson, Cr.**		
	By Cash, received from him on account . .	60	
	15		
1	**Joseph Hurd, Cr.**		
	By Cash, received from him on account .	45	
	18		
1	**Jonathan May, Dr.**		
	To Cash, paid him in full . . .	331	50

Boston, May 20, 1817.

L. F.				$.	C.
1	**James Munson, Dr.**				
	To 20 lb. coffee	*a*	,29		
	24 yds. linen	*a*	,95		
	10 gallons oil	*a*	$1,10		
	1¾ quintal fish	*a*	4,75		
				47	91
	25				
4	**William Greenwood, Dr.**				
	To 12½ lb. coffee	*a*	,29		
	7 lb. sugar	*a*	$1		
	4¼ lb. hyson tea	*a*	1,40		
	5 gals. oil	*a*	1,10		
	4 gals. molasses	*a*	,55		
				18	27
	28				
2	**Thomas Chandler, Dr.**				
	To 25 yards linen	*a*	,95	23	75
	31				
1	**Benjamin Gould, Cr.**				
	By Cash, received from him on account			54	50
	June 4				
1	**Benjamin Gould, Dr.**				
	To 24 lb. bohea tea	*a*	,85		
	12 lb. hyson	*a*	$1,40		
	10 gallons oil	*a*	1,10		
	35 lb. coffee	*a*	,29		
				58	35
	6				
2	**Thomas More, Dr.**				
	To 8½ gals. molasses	*a*	,55		
	5 gals. brandy	*a*	$2,50		
	6 do. rum	*a*	1,25		
				24	67
	10				
2	**Thomas Chandler, Dr.**				
	To 12¼ lbs. hyson tea	*a*	1,40		
	34 lb. coffee	*a*	,29		
	30 yards linen	*a*	,95		
	3 gals. Lisbon wine	*a*	1,50		
				60	36
	12				
1	**James Munson, Cr.**				
	By quarter cask cont'g. 34 gals. Lisbon wine	*a*	$1,25	42	50

Boston, June 15, 1817.

L. F.				$.	C.
4	**William Young, Dr.**				
	To 15 gals. gin	a	$2,25		
	3 quintals fish	a	4,50		
	18 lb. bohea tea	a	,85		
	10 gals. molasses	a	,55		
	15 do. Madeira wine	a	3,75		
				124	30
	20				
3	**John Grant, Dr.**				
	To 20 lb. mould candles	a	,28		
	14 lb. hyson tea	a	$1,40		
	1½ cwt. sugar	a	12,25		
				43	57
	25				
2	**James Dean, Cr.**				
	By 6 pair thread hose	a	$1		
	34 pieces of Nankins	a	,75		
	4 dozen pairs silk hose	a	2,50		
	2 do. gloves	a	1,25		
	2 dozen Leghorns	a	1,75		
	24 silk vests	a	2		
				271	50
	27				
3	**Amos Penniman, Dr.**				
	To 5 gallons Madeira Wine	a	$3,75		
	1 pair silk hose		3		
	2 silk vests	a	2,50		
	1 pair thread hose		1,50		
	1 do. silk gloves		1,50		
				29	75
	30				
2	**James Dean, Dr.**				
	To 10 gallons Madeira	a	$3,75		
	20 lb. coffee	a	,29		
	12 lb. hyson tea	a	1,40		
	3 gallons oil	a	1,10		
	12 lb. mould candles	a	,28		
	1 quintal fish	a	5		
				71	76

Boston, July 2, 1817.

L. F.			$.	C.
4	**Samuel Tuckerman, Cr.**			
	By 2 pieces super. broadcloth, 34 yds.	*a* $4,75		
	2 pieces calicoes, 34 yds.	*a* 8,50		
	1 do. 14½ yds.	7,50		
	1 piece bombazet, 30 yds.	10		
	1 piece black florentine, 30 yds.	20		
	1 do. black lutestring, 20 yds.	23		
	10 ps. India bandanna handkerchiefs	6		
	1½ doz. Ivory combs	*a* 3		
	2 do. long crooked combs	*a* 2		
			307	50
	3			
4	**Samuel Tuckerman, Cr.**			
	By 2 dozen white tapes	*a* ,80		
	5000 chapel needles	$2		
	3¼ lb. coloured sewing silk	*a* 5,25		
	3 pieces white flannel, 65 yds.	*a* ,50		
	2 pieces velvet, 33 yds.	*a* ,75		
	2 pieces twilled coating, 75 yds.	*a* 1		
	1 piece of satinet, 25 yds.	10		
	4 lb. coloured thread	*a* ,80		
	5 lb. white thread	*a* ,95		
	1 piece of light blue durant, 31 yds.	7,50		
	1 piece Scotch shirting, 70 yds.	*a* ,25		
	1 piece coloured lustring, 18 yds.	22		
	2 pieces Canton crape	*a* 12		
			249	88
	5			
3	**John Grant, Dr.**			
	To 10 gals. Madeira wine	*a* $3,75		
	8 do. rum	*a* 1,25		
	2 quintals fish	*a* 5		
			57	50
	10			
4	**Jonathan Boylston, Cr.**			
	By an order on James Nicholson		150	
	12			
3	**James Anderson, Dr.**			
	To 3¼ yds. superfine broadcloth	*a* $6,50		
	1 silk vest	2,50		
	2 pieces Nankins	*a* 1,25		
	3 pair silk hose	*a* 3,25		
	2 pair thread hose	*a* 1,50		
			38	87

Boston, July 15, 1817.

L. F.				$.	C.
5	**Thomas Henshaw, Dr.**				
	To 6½ yards superfine broadcloth	*a*	$6,50		
	3 Leghorns	*a*	2,50		
	½ dozen pair silk hose	*a*	3		
	2 silk vests	*a*	2,50		
				72	75
	18				
4	**William Greenwood, Cr.**				
	By his bill for repairs on house			10	25
	Cash, received from him on account			5	50
				15	75
	23				
4	**Samuel Tuckerman, Dr.**				
	To 8 gallons Madeira	*a*	$3,75		
	5 do. brandy	*a*	2,50		
	10 lb. Hyson tea	*a*	1,40		
	8 gallons rum	*a*	1,25		
	50 lb. coffee	*a*	,28		
	15 lb. mould candles	*a*	,28		
	4 cwt. sugar	*a*	12,30		
				133	90
	27				
3	**John Grant, Cr.**				
	By Cash, received from him on account			90	
	31				
2	**Thomas Chandler, Cr.**				
	By Cash, received from him on account			90	81
	August 2				
5	**Joseph Brigham, Dr.**				
	To 4 pieces Nankins	*a*	$1,25		
	6½ yards superfine broadcloth	*a*	6,50		
	12½ do. calico	*a*	,65		
	5 do. black florentine	*a*	1,10		
	1 piece bandannas		7		
	6½ yards black lustring	*a*	1,50		
				77	62
	5				
2	**James Trask, Dr.**				
	To Cash, paid him on account			350	

Boston, August 8, 1817.

L. F.				$.	C
1	**David Eaton, Dr.**				
	To 8 yards superfine broadcloth	*a*	$6,75		
	8 yards calico	*a*	,65		
	100 chapel needles		,40		
	1 piece of India bandannas		7		
	3 pairs thread hose	*a*	1,40		
	2 do. silk gloves	*a*	1,50		
				73	80
	10				
4	**William Greenwood, Dr.**				
	To 8 gallons molasses	*a*	,55		
	28 lb. sugar	*a*	$12,25		
	5 gallons rum	*a*	1,25		
	5 lb. candles	*a*	,22		
	2 lb. bohea tea	*a*	,85		
				16	51
	15				
1	**James Munson, Dr.**				
	To 6½ yds. superfine broadcloth	*a*	$6,75		
	11 yds. white flannel	*a*	,66		
	½ lb. sewing silk	*a*	1,80		
	6 yards florentine	*a*	1,10		
	13½ do. bombazet	*a*	,42		
				63	85
	20				
1	**Benjamin Gould, Cr.**				
	By his Check on Union Bank			70	
	24				
3	**James Trask, Dr.**				
	To Cash, paid him on account			200	
	27				
2	**Thomas Andrews, Dr.**				
	To 13½ yards calico	*a*	,65		
	6¾ yards black lutestring	*a*	$1,50		
	2 pieces Nankins	*a*	1,25		
	6 pair silk hose	*a*	3		
	3 pair silk gloves	*a*	1,45		
	3 Leghorns	*a*	2,50		
				51	25

Boston, August 28, 1817.

L. F.				$.	C.
4	**William Bradley, Dr.**				
	To 1 piece Canton crape, 18 yards		$18		
	6½ yards coloured lutestring	*a*	1,50		
	8¼ do. satinet	*a*	,60		
	8 do velvet	*a*	2		
	100 chapel needles		,40		
	¼ lb. coloured sewing silk	*a*	1,80		
				49	55
	29				
4	**William Bradley, Dr.**				
	To 2 ivory combs	*a*	,30		
	4 long crooked combs	*a*	,25		
	6 yards black florentine	*a*	$1,10		
	3 pieces Nankins	*a*	1,10		
	½ dozen pair silk hose	*a*	3		
	2 pair silk gloves	*a*	1,45		
	4 Leghorns	*a*	2,50		
	2 silk vests	*a*	2,50		
	3¼ yds. superfine broadcloth	*a*	6,75		
	1 piece of bandanna handkerchiefs		7		
				76	34
	31				
4	**Samuel Tuckerman, Dr.**				
	To 10 gallons gin	*a*	$2,25		
	2 quintals fish	*a*	5,		
	5 gallons Lisbon wine	*a*	1,50		
				40	
	Sept. 2				
2	**James Dean, Dr.**				
	To 8 gallons Madeira wine	*a*	$3,75		
	100 lb. coffee	*a*	,28		
	10 lb. hyson tea	*a*	1,40		
	15 lb. mould candles	*a*	,28		
	5 gallons rum	*a*	2,50		
	4 do. gin	*a*	2,25		
	2¼ cwt. sugar	*a*	12,25		
				125	26
	5				
3	**Rufus Perkins, Dr.**				
	To 10 gallons Madeira	*a*	$3,75		
	3 do. gin	*a*	2,25		
	1½ quintal fish	*a*	5		
	18 lb. mould candles	*a*	,28		
				56	79

Boston, September 8, 1817.

L. F.				$.	C.
5	**Thomas Gibson, Dr.**				
	To 9 yards broadcloth	*a*	$4,50		
	1 silk vest		2,50		
	2 pieces Nankins	*a*	1,25		
	3 pairs silk hose	*a*	3		
	4 pairs silk gloves	*a*	1,45		
				60	30
	12				
1	**David Eaton, Cr.**				
	By Cash, received from him on account			80	50
	15				
1	**Joseph Hurd, Dr.**				
	To 7½ yards calico	*a*	,75		
	6 do. bombazet	*a*	,42		
	2 pieces Nankins	*a*	$1,25		
	4 pair silk gloves	*a*	1,45		
				16	44
	20				
3	**John Grant, Cr.**				
	By Cash, received from him on account			28	50
	24				
1	**Jonathan May, Dr.**				
	To 3 pieces Nankins	*a*	$1,25		
	8¼ yards broadcloth	*a*	4,75		
	15 yards linen	*a*	,95		
	6 do. black florentine	*a*	1,10		
	4 pair silk gloves	*a*	1,45		
				70	77
	26				
1	**James Munson, Cr.**				
	By his check on the Union Bank for			112	
	30				
1	**Benjamin Gould, Dr.**				
	To 5 gals. brandy	*a*	$2,50		
	4 do. gin	*a*	2,25		
	1½ quintal fish	*a*	5		
	¾ cwt. sugar	*a*	12,25		
				38	19
	October 1				
3	**James Anderson, Cr.**				
	By Thomas Winslow's acceptance of a draft for			50	
	7				
3	**Amos Penniman, Cr.**				
	By Cash, received from him on account			28	50

Boston, October 8, 1817.

L. F.				$.	C.
1	**David Eaton, Dr.**				
	To 1 piece bandannas		$7		
	6 yds. coloured lustring	*a*	1,50		
	7 do. calico	*a*	,75		
	200 chapel needles	*a*	,40		
	½ lb. sewing silk	*a*	7,20		
	4 pair silk gloves	*a*	1,45		
				31	45
	9				
2	**Thomas Chandler, Dr.**				
	To 10 gals. brandy	*a*	$2,75		
	4 do. rum	*a*	1,25		
	3 do. Lisbon wine	*a*	1,50		
	8 lb. bohea tea	*a*	,85		
				43	80
	10				
2	**Thomas Moore, Cr.**				
	By Cash, received from him on account			4	67
	,,				
4	**William Greenwood, Cr.**				
	By Cash, received from him on account			20	00
	12				
3	**James Trask, Dr.**				
	To 15 yards white flannel	*a*	,66		
	4¾ yards black lustring	*a*	$1,50		
	4 long crooked combs	*a*	,25		
	4 pair silk hose	*a*	3		
	2 silk vests	*a*	2,50		
				35	02
	14				
2	**James Dean, Dr.**				
	To 7 yards florentine	*a*	$1,10		
	10½ yards bombazet	*a*	,42		
	1 dozen tape		,75		
	10 yards white flannel	*a*	,66		
	8¼ yards broadcloth	*a*	4,75		
				61	02
	16				
4	**Jonathan Boylston, Dr.**				
	To 12 yards durant	*a*	,38		
	8 do. velvet	*a*	$2		
	20 do. white flannel	*a*	,66		
				33	76

Boston, October 18, 1817.

L. F.					D.	C.
4	**William Young, Cr.**					
	By an order on David Newman for . . .				124	25
	20					
4	**Samuel Tuckerman, Dr.**					
	To Cash paid him on account . . .				200	00
	21					
4	**Jonathan Boylston, Cr.**					
	By Cash, received from him on account .				60	99
	22					
5	**Thomas Henshaw, Cr.**					
	By his Check on Massachusetts Bank for .				75	00
	23					
5	**Joseph Brigham, Cr.**					
	By Cash, received from him on account .				67	37
	25					
5	**Thomas Gibson, Cr.**					
	By a bill on James White at 10 days . .				54	50
	26					
2	**Thomas Moore, Dr.**					
	To 2 lb. coloured thread . . .		a	$1,25		
	2 lb. white do. . . .		a	1,20		
	20 yards Scotch shirting . .		a	,30		
	2 ivory combs		a	,30		
	4 long crooked do. . . .		a	,25		
	4 silk vests		a	2,50		
					2	50
	28					
1	**Benjamin Gould, Dr.**					
	To 20 gallons rum		a	$1,25		
	10 do. gin		a	2,25		
	30 yards Scotch shirting . .		a	,30		
	900 chapel needles . . .		a	,40		
					50	10
	30					
1	**James Munson, Dr.**					
	To 12 gallons oil		a	$1,10		
	1 quintal fish			5		
	20 yards Scotch shirting . .		a	,30		
	2 lb. white thread . . .		a	1,20		
					2	60

Boston, November 1, 1817.

L. F.				.	C.
5	**Joseph Brigham, Dr.**				
	To 2500 chapel needles	a	,40		
	½ dozen ivory combs	a	,30		
	1 dozen long crooked do.	a	,25		
	3 silk vests	a	$2,50		
	1½ lb. sewing silk	a	7		
	10 yards durant	a	,38		
				36	60
	3				
4	**Samuel Tuckerman, Dr.**				
	To 22 gallons Madeira wine	a	$3,75		
	15 do. Lisbon	a	1,50		
	20 do. gin	a	2,25		
				150	00
	8				
5	**Thomas Henshaw, Dr.**				
	To 9 yds. white flannel	a	,66		
	1 lb. coloured thread		$1,10		
	1 lb. white do.		1		
	3 pieces bandannas	a	7		
	5 pieces Nankins	a	1,25		
	13¼ yds. broadcloth	a	4,75		
	4 silk vests	a	2,50		
				108	23
	10				
5	**Thomas Gibson, Dr.**				
	To 12 pieces Nankins	a	$1,25		
	1 doz. silk hose	a	3		
	3 silk vests	a	2,50		
	5½ yds. coloured lustring	a	1,50		
				66	75
	12				
5	**David Ramsay, Dr.**				
	To 2 cwt. sugar	a	$12,25		
	100 lb. coffee	a	,29		
	15 gallons brandy	a	2,75		
	10 do. rum	a	1,25		
	10 lb. hyson tea	a	1,40		
				121	25

Boston, November 15, 1817.

L. F.				$.	C.
1	**James Munson, Dr.**				
	To 1 piece bandannas		$7		
	14 Leghorns	*a*	2,40		
	7 pair silk hose	*a*	3,25		
	1 dozen tape		,75		
	1 lb. coloured sewing silk		7		
	1000 capel needles	*a*	,40		
	2 pair thread hose	*a*	1,50		
				78	10
	18				
4	**William Young, Dr.**				
	To 50 lb. coffee	*a*	,29		
	20 lb. bohea tea	*a*	,85		
	8 gals. Lisbon wine	*a*	$1,50		
				43	50
	20				
3	**James Anderson, Dr.**				
	To 1 piece Canton crape		$18		
	16¾ yds. satinet	*a*	,60		
	16 do. velvet	*a*	2		
	25 do. twilled coating	*a*	1,25		
	½ dozen crooked combs	*a*	,25		
	2000 chapel needles	*a*	,40		
				100	80
	25				
5	**Joseph Brigham, Dr.**				
	To 8 ivory combs	*a*	,30		
	1 dozen crooked combs	*a*	,25		
	25 yds. twilled coating	*a*	$1,25		
	1 lb. coloured thread		1		
	2000 chapel needles	*a*	,40		
	2 pieces bandannas	*a*	7		
				59	65
	27				
4	**Jonathan Boylston, Dr.**				
	To 3½ sugar	*a*	$12,25		
	30 lb. coffee	*a*	,29		
	10 gallons molasses	*a*	,55		
	1 quintal fish		5		
	10 gallons gin	*a*	2,25		
	26 lb. bohea tea	*a*	,85		
				106	67

Boston, November 30, 1817.

L.F.			$.	C.
2	**James Dean, Dr.**			
	To 25 gallons Madeira	@ $3,75		
	20 lb. hyson tea	@ 1,40		
	30 lb. coffee	@ ,29		
	2 quintals fish	@ 5		
	20 gallons rum	@ 1,25		
	18 do. brandy	@ 2,75		
			214	95
	December 2			
4	**William Greenwood, Dr.**			
	To 25 lb. bohea tea	@ ,85		
	12 gallons oil	@ $1,25		
	25 gallons molasses	@ ,60		
	10 do. brandy	@ 2,75		
			78	75
	5			
3	**Amos Penniman, Dr.**			
	To 29½ lb. coffee	@ ,29		
	20 gallons molasses	@ ,60		
	1 quintal fish	$5		
	25 lb. candles	@ ,22		
	15 gallons oil	@ 1,10		
			47	55
	8			
1	**Joseph Hurd, Dr.**			
	To 14¼ gallons molasses	@ ,60		
	18 gallons rum	@ $1,25		
	59 lb. bohea tea	@ ,85		
	10 gallons oil	@ 1,10		
	1 quintal fish	5		
			97	20
	10			
5	**Benjamin Franklin, Dr.**			
	To 19 gallons Madeira wine	@ $3,75		
	7 lb. mould candles	@ ,22		
	2 0 14 lb. sugar	@ 12,25		
	17 gallons rum	@ 1,25		
	30 lb. hyson tea	@ 1,40		
	22 gallons gin	@ 2,25		
	15 do. brandy	@ 2,75		
			252	82

Boston, December 12, 1817.

L. F.				
2	**James Dean, Dr.**			
	To 18 gallons gin	*a*	$2,25	
	31 lb. candles	*a*	,22	
	15 gallons oil	*a*	1,10	
			63	82
	15			
4	**William Young, Dr.**			
	To 25 gallons brandy	*a*	$2,75	
	22 do. oil	*a*	1,10	
	35 lb. hyson tea	*a*	1,40	
			141	95
	18			
3	**John Grant, Dr.**			
	To 30½ lb. bohea tea	*a*	,85	
	18 gallons brandy	*a*	$2,75	
	23½ hyson tea	*a*	1,40	
			108	19
	19			
1	**David Eaton, Cr.**			
	By Cash, received from him in full		33	54
	20			
1	**James Munson, Cr.**			
	By his note, dated this day, payable to my order, at 90 days, for balance of his account		75	16
	21			
2	**Thomas Andrews, Cr.**			
	By David Standwood's acceptance of a draft to my order, dated this day, payable at sight, for $51,25 being the balance of his account		51	25
	"			
3	**Rufus Perkins, Cr.**			
	By Cash in full		54	85
	22			
3	**John Grant, Cr.**			
	By Cash, received from him to balance account		108	38
	"			
3	**James Anderson, Cr.**			
	By his Check on Boston Bank for		102	48
	23			
3	**Amos Penniman, Cr.**			
	By Cash, received from him in full		48	80
	"			
2	**James Dean, Cr.**			
	By his Check on Boston Bank for		271	55

Boston, December 24, 1817.

L. F.		$.	C.
1	**Joseph Hurd, Cr.**		
	By Cash, received from him in full .	117	75
	"		
1	**Benjamin Gould, Cr.**		
	By his Check on Manufacturers' and Mechanics' Bank at Boston, for	87	44
	25		
4	**William Bradley, Cr.**		
	By Cash, received from him in full .	8	00
	"		
1	**Jonathan May, Cr.**		
	By Cash in full	70	77
	"		
4	**William Young, Cr.**		
	By Cash, received from him in full .	18	50
	26		
5	**Thomas Henshaw, Cr.**		
	By Cash, received from him in full .	105	98

Dr. David Eaton,

1817.	J	F		£.	C.
Jan.	5	1	To Sundries, as per Journal . .	31	85
Feb.	25	2	— Sundries	31	94
Aug.	8	9	— Sundries	73	80
Oct.	8	12	— Sundries	31	45
				169	04

Dr. James Munson,

1817.				£.	C.
Jan.	12	1	To Sundries, as per J. . . .	68	20
May	20	5	— Sundries	47	91
Aug.	15	9	— Sundries	63	85
Oct.	30	13	— Sundries	26	60
Nov.	15	15	— Sundries	78	10
				284	66

Dr. Joseph Hurd,

1817.				£.	C.
Feb.	3	2	To Sundries, as per J. . . .	49	11
Sept.	15	11	— Sundries	16	44
Dec.	8	16	— Sundries	97	20
				162	75

Dr. Benjamin Gould,

1817.				£.	C.
Feb.	6	2	To Sundries, as per J. . . .	65	30
June	4	5	— Sundries	58	35
Sept.	30	11	— Sundries	38	19
Oct.	28	13	— Sundries	50	10
				211	94

Dr. Jonathan May,

1817.				£.	C.
May	16	4	To Cash in full	331	50
Sept.	24	11	— Sundries	70	77
				402	27

Cr.

1817.			J F	$.	C.
Feb.	28	By Cash, in part . . .	3	25	
May	2	— Cash	4	30	
Sept.	12	— Cash	11	80	50
Dec.	19	Cash, for balance . . .	17	33	54
				169	04

Cr.

1817.						
May	5	By Cash, in part . . .		4	55	
June	12	— 34 gallons Lisbon wine . . @	$1,25	5	42	50
Sept.	26	— Check on Union Bank, Boston .		11	112	
Dec.	20	— Cash, in full . . .		17	75	16
					284	66

Cr.

1817.					
May	15	By Cash	4	45	
Dec.	24	— Cash in full . . .	18	117	75
				162	75

Cr.

1817.					
May	31	By Cash	5	54	50
Aug	20	— His check on Union Bank .	9	70	
Dec.	24	— His check on Mechanics' Bank .	18	87	44
				211	94

Cr.

1817.					
Feb.	10	By Sundries, as per Journal . .	2	331	50
Dec.	25	— Cash in full . . .	18	70	77
				402	27

Dr. David Eaton,

1817.		JF		£.	C.
Jan.	5	1	To Sundries, as per Journal . .	31	85
Feb.	25	2	— Sundries	31	94
Aug.	8	9	— Sundries	73	80
Oct.	8	12	— Sundries	31	45
				169	04

Dr. James Munson,

1817.					
Jan.	12	1	To Sundries, as per J. . . .	68	20
May	20	5	— Sundries	47	91
Aug.	15	9	— Sundries	63	35
Oct.	30	13	— Sundries	26	60
Nov.	15	15	— Sundries	78	10
				284	66

Dr. Joseph Hurd,

1817.					
Feb.	3	2	To Sundries, as per J. . . .	49	11
Sept.	15	11	— Sundries	16	44
Dec.	8	16	— Sundries	97	20
				162	75

Dr. Benjamin Gould,

1817.					
Feb.	6	2	To Sundries, as per J. . . .	65	30
June	4	5	— Sundries	53	35
Sept.	30	11	— Sundries	38	19
Oct.	23	13	— Sundries	50	10
				211	94

Dr. Jonathan May,

1817.					
May	16	4	To Cash in full	331	50
Sept.	24	11	— Sundries	70	77
				402	27

Cr.

1817.			J F	$.	C.
Feb.	28	By Cash, in part . . .	3	25	
May	2	— Cash	4	30	
Sept.	12	— Cash	11	80	50
Dec.	19	Cash, for balance . . .	17	33	54
				169	04

Cr.

1817.				J F	$.	C.
May	5	By Cash, in part . . .		4	55	
June	12	— 34 gallons Lisbon wine . . a	$1,25	5	42	50
Sept.	26	— Check on Union Bank, Boston .		11	112	
Dec.	20	— Cash, in full . . .		17	75	16
					284	66

Cr.

1817.			J F	$.	C.
May	15	By Cash	4	45	
Dec.	24	— Cash in full . . .	18	117	75
				162	75

Cr.

1817.			J F	$.	C.
May	31	By Cash	5	54	50
Aug	20	— His check on Union Bank .	9	70	
Dec.	24	— His check on Mechanics' Bank .	18	87	44
				211	94

Cr.

1817.			J F	$.	C.
Feb.	10	By Sundries, as per Journal . .	2	331	50
Dec.	25	— Cash in full . . .	18	70	77
				402	27

Dr. James Dean,

1817.		JF			
March	8	3	To Sundries as per Journal . .	6	24
June	30	6	— Sundries	71	76
Sept.	2	10	— Sundries	125	26
Oct.	14	12	— Sundries	61	02
Nov.	30	16	— Sundries	214	95
Dec.	12	17	— Sundries	63	82
				543	05

Dr. Thomas Chandler,

1817.						
May	28	5	To 25 yards linen . . a ,95	23	75
June	10	5	— Sundries	60	36
Oct.	9	12	— Sundries	43	80
				127	91

Dr. Thomas Moore,

1817.					
Jan.	1	1	To balance on old account . .	175	
June	6	5	— Sundries	24	67
Oct.	26	13	— Sundries	22	50
				222	17

Dr. James Trask,

1817.					
March	15	3	To Cash in full . . .	132	
Aug.	5	8	Cash in part . . .	350	
			Amount transferred to folio 3.	482	

Dr. Thomas Andrews,

1817.					
Jan.	15	1	To Cash in part . . .	140	
April	24	4	— Cash in full . . .	180	
Aug.	27	9	— Sundries	51	25
				371	25

Cr.

1817.			fp	$	C.
June	25	By Sundries as per J.	6	271	50
Dec.	23	By his check on Boston Bank	17	271	55
				543	05

Cr.

1817.					
Feb.	15	By Sundries as per Journal	2	37	10
July	31	— Cash	8	90	81
				127	91

Cr.

1817.					
Feb.	2	By Cash in full	2	175	
Oct.	10	— Cash	12	4	87
Dec.	31	— Account at folio 1 leger B.		42	50
				222	17

Cr.

1817.					
Jan.	1	By balance on former account	1	132	
April	15	— Sundries	4	771	75
		Amount transferred to folio 3.		903	75

Cr.

1817.					
Jan.	1	By stock	1	320	
Dec.	21	— D. Standwood's acceptance	17	51	25
				371	25

Dr. William Young,

1817.		ff		$	C.
Jan.	1	1	To balance of old account	224	
June	15	6	— Sundries	124	30
Nov.	15	15	— Sundries	43	50
Dec.	15	17	— Sundries	141	95
				533	75

Dr. Samuel Tuckerman,

1817.					
July	23	8	To Sundries	133	90
Aug.	31	10	— Sundries	40	
Oct.	20	13	— Cash	200	
Nov.	3	13	— Sundries	150	
Dec.	31		— Balance transferred to folio 1 Leger B.	33	46
				557	36

Dr. William Greenwood,

1817.					
March	12	3	To Sundries	12	17
May	25	5	Sundries	18	27
Aug.	10	9	Sundries	16	51
Dec.	2	16	Sundries	78	75
				125	70

Dr. Jonathan Boylston,

1817.					
March	31	3	To Sundries	45	85
Oct.	16	12	— Sundries	33	76
Nov.	27	15	— Sundries	106	67
Dec.	31		To Balance transferred to folio 1, Leger B.	24	71
				210	99

Dr. [redacted] William Bradley,

1817.					
Aug.	28	10	To Sundries	49	55
	29	10	— Sundries	76	34
				125	89

Cr.

1817.			JF	$.	C
April	20	By Cash in full	4	224	
Oct.	18	— An order on D. Newman	13	124	25
Dec.	25	— Cash in full	18	185	50
				533	75

Cr.

1817.					
July	2	By Sundries, as per Journal	7	307	50
	3	— Sundries	7	249	86
				557	36

Cr.

1817.					
April	10	By Cash	3	10	
July	18	— Sundries	8	15	75
Oct.	10	— Cash	12	20	
Dec.	31	— Balance due me transf. to folio 1, Leger B.		79	95
				125	70

Cr.

1817.					
July	10	By a draft on J. Nicholson	7	150	
Oct.	21	— Cash on account	13	60	99
				210	99

Cr.

1817.					
April	18	By 124 gallons oil	4	117	80
Dec.	25	— Cash in full	18	8	09
				125	39

Dr. Thomas Henshaw,

1817.	Jr			$.	C.
July	15	8	To Sundries	72	75
Nov.	8	14	— Sundries	108	23
				180	98

Dr. Joseph Brigham,

1817.					
Aug.	2	8	To Sundries	77	62
Nov.	1	14	— Sundries	36	60
	25	15	— Sundries	59	65
				173	87

Dr. Thomas Gibson,

1817.					
Sept.	8	11	To Sundries	60	30
Nov.	10	14	— Sundries	66	75
				127	05

Dr. David Ramsey,

1817.					
Nov.	12	14	To Sundries	121	25

Dr. Benjamin Franklin,

1817.					
Dec.	10	16	To S[illegible]s	252	82

Dr. Balance,

1817.					
Dec.	3	[illegible]	omas Moore, due to me .	42	50
		4	— William Greenwood . .	79	95
		5	— Joseph Brigham . . .	106	
		5	— Thomas Gibson . . .	72	55
		5	— David Ramsey . . .	121	25
		5	— Benjamin Franklin . .	252	82
				676	00

Cr.

1817.			JF	$	C.
Oct.	22	By Check on Massachusetts Bank .	13	75	
Dec.	26	— Cash in full . . .	18	105	98
				180	98

Cr.

1817.					
Oct.	23	By Cash	13	67	87
Dec.	31	— Balance due to me transf. to folio 1 Leger B.		106	
				173	87

Cr.

1817.					
Oct.	25	By bill on James White at 10 days .	13	54	50
Dec.	31	— Balance due to me transf. to folio 1 Leger B.		72	55
				127	05

Cr.

1817.					
Dec.	31	By Balance transferred to folio 1 Leger B.		121	25

Cr.

1817.					
Dec.	31	By Balance transferred to folio 1 Leger B.		252	82

Cr.

1817.					
Dec.	31	By Jonathan Boylston, due to him .	1	23	71
		— James Trask . . .	3	186	72
		— Samuel Tuckerman . .	4	33	46
				243	89

LEGER B.

Dr. Thomas Moore,

1818.		LF		$	C.
Jan.	1		To balance at folio 2 Leger A. . .	42	50

Dr. William Greenwood,

1818.					
Jan.	1		To balance at folio 4 Leger A. . .	79	95

Dr. Jonathan Boylston,

1818.					

Dr. James Trask,

1818.					

Dr. Samuel Tuckerman,

1818.					

Dr. Joseph Brigham,

1818.					
Jan.	1		To balance at folio 5 Leger A. . .	106	

Dr. Thomas Gibson,

1818.					
Jan.	1		To balance at folio 5 Leger A. . .	72	55

Dr. David Ramsey,

1818.					
Jan.	1		To balance at folio 5, Leger A. . .	121	25

Dr. Benjamin Franklin,

1818.					
Jan.	1		To balance at folio 5 Leger A. . .	252	82

LEGER B.

Cr.

			JF	$.	C.

Cr.

Cr.

1818. Jan.	1	By balance at folio 4 Leger A. . .		24	71

Cr.

1818. Jan.	1	By balance at folio 3 Leger A. . .		186	72

Cr.

1818. Jan.	1	By balance at folio 4 Leger A. . .		33	46

Cr.

Cr.

Cr.

Cr.

(Book-Keeping by single entry does not show what goods are unsold or the profits or losses, except when the transactions are very few. The Leger containing nothing but the accounts of persons dealing on credit, only shows the merchant what debts are due to him, and what he owes to others.

If therefore he wishes to know what goods remain unsold and what his profits and losses by the whole or any part of his business, he cannot obtain this knowledge by single entry without "taking account of stock," that is, by weighing or measuring every article remaining unsold, which are commonly valued at prime cost. The value being added to the money on hand, will exhibit the net of the estate, which, compared with the original stock, will show the Profit and Loss.

Hence it appears evident, that Book-keeping by single entry is essentially defectivo in its not giving the merchant a correct knowledge of the state of his affairs, without the laborious task of "taking account of stock," which is very subject to error, and can afford no adequate means either of preventing embezzlement or detecting fraud.

Fortunately, however, for the wholesale merchant, and the less extensive trader, these objects are attained by the Italian method of double entry, as effectually, perhaps, as the ingenuity of man can devise.

Every scholar, therefore, who wishes to become a complete accountant, must be conversant with that system, which being upon universal principles, and clearly understood by the pupil, will easily lead to the invention of other plans more conveniently adapted to any particular purpose.)

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A

NEW AND CONCISE

SYSTEM

OF

BOOK-KEEPING,

BY

DOUBLE ENTRY;

CALCULATED FOR THE USE OF

WHOLESALE, DOMESTIC AND FOREIGN

TRADE,

AS CONDUCTED IN THE

UNITED STATES.

The whole designed for the use of Schools and Academies.

BY D. STANFORD, A. M.

BOOK-KEEPING.

EVERY mercantile transaction has two parts, or belongs to two accounts, and requires its distinct entry on the Dr. of the one, and on the Cr. of the other, to show the change of property. From this circumstance arises the distinguishing title of this method by Double Entry.

The art of Book-Keeping by Double Entry consists,

1. In recording, correctly and intelligibly, the transactions in the several books.
2. In transferring the several accounts from one book to another, with the corresponding Drs. and Crs.
3. In the method of balancing and closing the accounts.

There are three primary books used; viz.

1. The Waste, or Day Book.
2. The Journal.
3. The Leger.

The secondary or auxiliary books are,

1. The Cash	Book.	7. Ship's-account	Book.
2. Bill		8. Expense	
3. Invoice		9. Letter	
4. Sales		10. Postage	
5. Account-current		11. Receipt	
6. Commission		12. Check	

To which may be added, the Numero, or Ware-house Book, and Memorandum Book.

Part, or the whole, of the preceding books, are used by merchants, as the extent and nature of their business may require.

WASTE-BOOK.

For the form and use of this book, see the Waste, or Day Book, in Single Entry.

THE JOURNAL.

The Journal is a fair transcript of all the transactions, recorded in the Waste Book, compiled in the same order, but differently expressed. Here the two parts, which belong to every transaction, in the Waste, are clearly distinguished by their proper titles with their mutual relation of Dr. and Cr. to facilitate their transfer to their separate accounts in the Leger.

The form of this book is similar to the Waste, with this only exception, that on the left hand, there are two columns for references to the folio of the account in the Leger, the first for the Dr. and the second for the Cr. See specimen annexed.

An experienced book-keeper can easily dispense with either the Waste book, or Journal; but the young book-keeper needs them both, for simplicity and clearness.

The art of Book-keeping, by the Italian method, wholly depends on a correct discrimination of the Dr. and Cr. of each transaction. The mode of ascertaining them, in double entry, is the same, in effect, as in single. But here *things*, as well as persons, are made Drs. and Crs. and one *thing*, or person, is made Dr. to another *thing*, or person, as Cr.

DEBTOR AND CREDITOR.

The following rules, for distinguishing the titles Dr. and Cr. with the explanations and notes, will greatly assist the young book-keeper in making the Journal entries from the Waste book and posting from the Journal to the Leger.

Rule I. When goods are sold on credit, the Purchaser is Dr. to goods; and Goods Cr. by the purchaser. See Waste and Journal, Jan. 2. Sold Charles Lee, sugar.

Explanation 1. As the sugar is sold but not paid for, Charles Lee must be made Dr. to sugar; and Sugar Cr. by Charles Lee, for the *quantity* and *price*.

Note 1. In all cases of selling, the goods, sold and delivered, are Cr. but the Dr. varies according to the terms of sale.

Rule II. When goods are sold for cash, make Cash Dr. to goods sold; and Goods Cr. by Cash. W. and J. Jan. 7. Sold rum for cash.

Explanation 2. As the rum is sold, and the money received at the time, it is not necessary to know to whom it was sold, but the money received, that is, Cash is Dr. to the rum, for its value; and the Rum Cr. by Cash for the quantity and price.

Rule III. When goods are sold for part cash and part on credit, make Sundries Dr. to goods sold; viz. *Cash*, for the sum received, and the *Purchaser*, for the rest; also Goods sold Cr. for the whole amount. W. and J. Sept. 27. Sold Winslow Lamb, tea.

Expl. 3. This case is the reverse of Feb. 22. Here Sundries are Dr. to tea; viz. *Cash*, for the money received, and *W. Lamb*, for the rest; then *Tea* is Cr. by sundries.

Rule IV. When goods are sold for part cash and part bills, make Sundries Dr. to goods sold; viz. *Cash*, for the money paid, and *Bills receivable*, for the rest, or value of the bill; also the Goods sold Cr. by sundries, specifying the price and quantity. W. and J. Jan. 27. Sold A. Eastman, lands, for *cash* and *bills*.

Expl. 4. In this case make Sundries Dr. to land for its value; viz. *Cash*, for the sum received, and *Bills receivable*, for the rest; also Land Cr. by sundries for the same value.

Note 2. If you sell a *house*, or *ship*, &c.; make the entry as in selling goods; viz. *Cash*, *Buyer*, &c.; Dr. to *house*, *ship*, &c.; for the value. Aug. 18. Aug. 19. Dec. 25.

Rule V. When goods are sold, and payment received by a bill or draft on another person, make *Bills receivable* Dr. to goods sold; and Goods, stating the price and quantity, Cr. by bills receivable, expressing on whom drawn. W. & J. Feb. 25. Sold N. Freeman linen for a bill on A. Young.

Expl. 5. Here *Bills receivable* are Dr. to linen, and *Linen* Cr. by bill on A. Young, for 600 yards *a* $1,20.

Note 3. When several sorts of goods are sold, there will be sundry Crs. viz. the several sorts, each for its value; but the Drs. will be the same as in Note 1. Thus, *Cash* Dr. to sundries, if sold for cash, *Buyer*, if on time, *Bills receivable*, if for bill.

Rule VI. Goods bought for ready money, are Dr. to *Cash*, and *Cash* Cr. by the goods. W. and J. Jan. 15. Bought port wine for cash.

Expl. 6. The port-wine being bought, and the money paid, Port-wine must be made Dr. to *Cash*, for the quantity and its value; and *Cash*, Cr. by port-wine for the same value.

As port-wine was a part of your stock, therefore when the same sort of goods are purchased of several persons and at different prices, it is convenient to have some mark to distinguish them, that when the account of such goods shall be balanced, the prime cost of those, which may remain unsold, can be known.

Note 4. Buying is the reverse of selling, and has the same variety of cases, in all which the goods bought and received are Dr. but the Cr. varies according to the conditions of the purchase. The rules for buying and selling merchant goods is to be applied in buying and selling any thing else; as, plate, jewels, furniture, ship, house, lands, &c.

Rule VII. Goods, bought on credit, are Dr. to the seller, and the Seller Cr. by goods. W. and J. Jan. 18. Bought of A. Newman, linen.

Expl. 7. As the linen is bought, but not paid for, you become Dr. to A. Newman for the same; but as you must not open an account with yourself, and because the linen has become a part of your stock, which represents you the merchant, the linen must be made Dr. to A. Newman, for the quantity and its value; also A. Newman Cr. by *linen*, for the same value.

Rule VIII. Goods, bought for part cash and part credit, are Dr. to sundries; viz. To *Cash*, paid in part, and *to Seller* for the rest. W. and J. Feb. 22. Bought of W. Lamb, broadcloth.

Expl. 8. Here broadcloth must be made Dr. to sundries, expressing the quantity and price; and *Cash*, Cr. by broadcloth, for the money paid and W. Lamb, Cr. by broadcloth for the rest; viz. $875.

Rule IX. When goods are bought, part for cash and part for bill, make Goods Dr. to sundries; viz. To *Cash*, for the sum paid, and To *Bills receivable* for value of the bill. W. and J. April 15. Bought of R. Lakeman, sundries.

Expl. 9. This is an entry, complex in both its terms, that is, two Drs. and two Crs. Therefore in this, as in all similar cases, the best rule is to resolve the case into two entries; viz. First, make the Goods, that is, Sundries, Dr. to the Seller, R. Lakeman, for their full value, as if they had been bought on credit; then make the Seller, R. L. Dr. to sundries; viz. To *Cash*, for the sum paid, and to *Bills receivable*, for value of the bill. See directions for writing in the Journal, complex entry.

Note 5. When goods are bought, part for cash, part credit, and part bill, make goods bought Dr. to sundries; viz. *To Cash*, for sum paid, To bills receivable, for value of the bill, and To seller, for the rest.

Rule X. When money is paid, the *Receiver* is Dr. to *Cash*; and Cash Cr. by the receiver, for the sum paid. W. and J. Jan. 12. Paid James Lewis in full.

Expl. 10. By the Inventory it appears you owed J. Lewis $140, and consequently he stands credited by this sum in the Leger; therefore as no erasures or crossings are allowable in mercantile books, you must discharge the debt, by debiting J. Lewis to Cash for the money paid him in full; also Cash Cr. by J. Lewis.

Note 6. In all cases of paying money Cash is Cr. but the Dr. varies according to the terms on which the money is delivered.

Note 7. In paying money you must always mention whether in full or in part.

Rule XI. When you lend money on security, make the *Borrower*, *Notes*, or *Bills receivable*, Dr. to Cash, naming the sum and security; also Cash Cr. by the *borrower*, *note*, or *bills receivable*, naming also the sum and security. W. and J. Feb. 2. Lent S. Tyler, on bond, &c.

Expl. 11. You need only make S. Tyler Dr. to Cash for the principal received, and Cash Cr. by S. Tyler, for the same sum, omitting the interest, until it shall be paid.

Note 8. When you borrow money, make *Cash* Dr. to the lender, notes, or bills payable; and the Lender, Notes, or Bills Payable Cr. by cash.

Rule XII. When you pay charges on goods, repairs or reimbursements on a ship, taxes or repairs on a house, &c.; make *Goods*, *Ship* or *House* Dr. to Cash; and Cash Cr. by goods, ship, house, &c. W. and J. Feb. 20. March 18, 27. Dec. 2.

Rule XIII. When you pay expenses for house-rent, servants' wages, or any other incidental expense for yourself or family, make Expense-account Dr. to Cash for the total; and Cash Cr. by the same sum. W. and J. April 6. Paid expenses this quarter, &c.

Expl. 12. A prudent, frugal merchant, while doing business will ever feel anxious to know the true state of his affairs, and will therefore keep a book of expenses, and once a month, or quarter, as in this treatise, transfer the total amount to the Waste book, to be regularly posted into the Journal and Leger, making *Expense-account* Dr. to cash for the quarterly (or monthly) expenses; and Cash Cr. by the same.

Note 9. When you pay charges that belong to trade in general, such as warehouse-rent, shop-rent, postage of letters, &c.; enter Charges of merchandise Dr. to Cash.

Rule XIV. When you receive the payment of a debt, make Cash Dr. to the payer; and Payer Cr. by cash for the sum received. W. and J. Jan. 29. Received from Thomas Lamson, Cash in full.

Expl. 13. By the Inventory it appears that Tho. Lamson owed you $400; therefore, to prevent blottings or crossings, you must reduce the debt, by making Cash Dr. to Thomas Lamson, for the sum received, and Thomas Lamson Cr. by Cash for the same sum.

Note 10. In all cases of receiving money Cash is Dr. but the Cr. varies according to the terms on which the money is received.

Note 11. In all receipts for money, always state whether in part or in full.

Rule XV. When you receive interest on money lent, or on notes, make Cash Dr. to Interest account, if any opened in the Leger, if not, make Cash Dr. to Profit and Loss; and Profit and Loss Cr. by Cash. W. and J. Dec. 30. Received from Robert Means interest for 9 months.

Rule XVI. When you receive both principal and interest, make Cash Dr. to sundries; viz. To Borrower for the principal, and to Profit and Loss for the interest; also the Borrower Cr. by the principal, and Profit and Loss Cr. by the interest. W. and J. Dec. 20. Received from S. Tyler balance due on his bond, &c.

Expl. 14. Although you received all the balance of principal and interest from S. Tyler, yet you must make Cash Dr. to sundries, for the whole balance due, and then make S. Tyler Cr. by Cash for balance of the principal, and Profit and Loss Cr. by cash, for the interest.

Note 12. When notes or bills receivable are paid with the interest make Cash Dr. to Sundries, for the whole; and Notes or Bills receivable Cr. by Cash, for the principal, and Profit and Loss Cr. by Cash, for the Interest. W. and J. April 6.

Rule XVII. When you receive payment in part or in full of the principal of money lent, make Cash Dr. to the borrower, for the sum received, naming the security; also the Borrower Cr. by Cash for the same sum. W. and J. July 2. S. Tyler.

Expl. 15. This case differs nothing from Rule XIV. and therefore needs no further explanation.

Note 13. When you pay cash for principal and interest, make Sundries Dr. to Cash, viz. To the Lender, for the principal, and to Profit and Loss for the interest.

Note 14. If you pay interest only, make Profit and Loss Dr. for the interest.

Rule XVIII. When you receive the payment of a note or bill, make Cash Dr. to bills receivable or to the person on whom the bill is drawn; and Bills receivable Cr. by Cash, or to the same person. W. and J. Feb. 5. Jacob Thomson's note.

Expl. 16. Here Cash must be Dr. to bills receivable, for J Thomson's note; and Bills receivable Cr. by the same.

Let it be observed, that if a note is given up for a renewal of the same, First, make the person who gives up the note Dr. to bills receivable, and Bills receivable Cr. by the same person; Secondly, Bills receivable Dr. to the same person, for the renewed note or bill; also the Person Cr. by bill or note renewed. W. and J. Dec. 20.

Note 15. When you pay cash for a bill, note or acceptance due from you to another, make Bills payable Dr. to Cash, naming the person; and Cash Cr. by bills payable, naming also the person. W. and J. June 10. Aug. 25. Oct. 30.—This case is similar to paying money under Rule X.

Rule XIX. When you give a bill or note in payment for goods purchased, but not booked, the Person to whom the bill is given is Dr. to bills payable; and Bills payable Cr. by the same person. W. and J. April 12.

Rule XX. When you give in a note or bill to be discounted, make Sundries Dr. to bills receivable; viz. Cash for the net sum received, and Profit and Loss Dr. for the discount; also *Bills receivable* Cr. by sundries for the whole value of bill. W. and J. Feb. 26. Discounted A. Young's note.

Expl. 17. Although you did not receive the whole value of the note, it must be discharged the same as if you did, therefore, Sundries must be Dr. to bills receivable, viz. Cash for what you received, and Profit and Loss Dr. for the discount, and *Bills receivable*, Cr. by sundries for the whole face of the note.

Note 16. This rule will apply in all cases where discount is made for prompt payment.

Note 17. When you discount a bill to another person, make Bills receivable Dr. to sundries; viz. to *Cash*, for net sum paid, and Profit and Loss Dr. for the discount.

Rule XXI. When a person fails, and compounds with his creditors, make the Bankrupt Cr. by Sundries, for the whole debt due by him; and Cash Dr. for the sum received in the composition; also Profit and Loss Dr. for the Loss. W. and J. Dec. 14. A. Newman becomes a bankrupt, &c.

Note 18. This case is much like that under Rule XX. therefore it needs no farther explanation.

Rule XXII. When you receive the freight of a ship, or charter of a vessel, or the rent of a house, make Cash Dr. to the ship or house, for the sum received, and Ship or House Cr. by Cash, for the freight or rent. W. and J. Nov. 27. Received from Jones & Penniman freight of the ship Massachusetts.

Note 19. Debit and credit here as under Rule XIV.

Rule XXIII. When you pay cash for ensurance on a ship, goods or cargo, make the Ship or Goods or Voyage to ——, Dr. to *Cash*, for the ensurance money; and Cash Cr. by ship or goods or voyage to ——, for the same sum. W. and J. Feb. 28. April 10.

Expl. 18. The charge of ensurance being an additional expense on the ship, goods or cargo, they must be debited for Cash; and therefore Cash Cr. by ship, goods or cargo, for the same sum.

Rule XXIV. When you pay money for charges on a voyage, make Voyage to or from ——, Dr. to Cash, expressing for what; and Cash Cr. by voyage to or from ——. W. and J. Nov. 13. Entered at the Custom-house my goods from Bourdeaux, and paid duties, &c.

Expl. 19. As this, like Rule 23, is a farther expense on the voyage, you must make Voyage from Bourdeaux Dr. to Cash, for the duties and other charges; and Cash Cr. by voyage from Bourdeaux, for the same charges.

Rule XXV. When goods are bartered for others of equal value, make Goods received Dr. to goods delivered: and Goods delivered Cr. by goods received, naming the price and quantity of each. W. and J. Jan. 20. Bartered sugar for coffee.

Expl. 20. When one commodity is sold, or exchanged, for another, it is called Barter; and when one sort of goods is exchanged for another of equal value, as in this case, make the Coffee received Dr. to the sugar delivered.

Note 20. When one sort of goods is received for several sorts delivered, make Goods Dr. to Sundries; viz. To the several sorts of goods, delivered, for their respective values.

Note 21. When several sorts of goods are received for one sort delivered, make Sundries; viz. the several goods received, each for its value, Dr. to goods delivered.

Rule XXVI. When several sorts of goods are bartered for several others, and that whether the goods, received and delivered, are equal in value or not, make two entries; First—Make the person with whom the barter is made Dr. to sundries; that is, to each sort delivered, for its respective value; Secondly—Make Sundries, that is, each sort of goods, received Dr. to the person with whom the barter is made, for its respective value. W. and J. April 4. Bartered with R. Means, &c.

Expl. 21. This is a case complex in both its terms, and requires two entries, therefore, First, make Robert Means Dr. to sundries; viz. sugar and rum delivered him, and Sundries; viz. Sugar and Rum Cr. by the goods delivered—secondly, make Sundries; viz. Ashes and Tow-cloth, received, Dr. to R. Means, and Robert Means, Cr. by sundries, viz. ashes and tow-cloth received.

See directions for writing in the Journal, complex entry.

Rule XXVII. When goods are shipped off, for your own account, from your ware-house, and consigned to a factor, make Voyage to ——, Dr. to sundries; viz. To the respective *goods*, for their prime cost, and To *Cash*, for shipping and other charges; also Sundries; viz. the re-

spective goods, and Cash, Cr. by voyage to ——. W. and J. May 8. Shipped on board the General Hamilton for Oporto and consigned to F. Alvardo & Co.

Expl. 22. As the goods are consigned to F. Alvardo & Co. for your own account, you must make voyage to Oporto, consigned to F. Alvardo & Co. Dr. to sundries, for the whole cost and charges; and the several articles of goods shipped (entered in the books) Cr. by voyage to Oporto.

NOTE 22. Foreign trade comprises three things; viz. 1. The shipping off the goods to a factor. 2. Advices concerning them from the factor. 3. The returns made by the factor to you.

NOTE 23. In all cases of shipping off goods to a factor, Voyage to —, is always Dr. but the Cr. varies according as the goods shipped off are booked, that is, taken from your warehouse, or presently bought, which may be either for cash, or on credit.

RULE XXVIII. When you ship off goods bought on credit, make Voyage to ——, Dr. to sundries; viz. To seller or sellers, for value of the goods at prime cost, To Cash, for shipping charges, also Sundries, viz. the Seller or Sellers Cr. by the voyage to ——, for the value of goods, and Cash Cr. by the voyage to ——, for the charges. W. and J. April 10. Voyage to Bourdeaux, &c.

Expl. 23. This case differs but very little from the preceding rule, and therefore is easily posted, make the Seller or Sellers Creditors, instead of the goods as above.

NOTE 24. Voyage must be debited for all charges which increase the cost, and credited for whatever lessens the cost; such as bounties or drawbacks on exported goods; thus for bounties, make *Cash* or *Custom-House Debentures*, (as you may receive *money*, or procure a debenture-bill) Dr. to voyage. When you receive payment of the debenture-bill, make *Cash* Dr. to Custom-House debentures.

NOTE 25. For drawbacks, make *Cash*, or Custom-House Bonds, (as you may receive cash or take up your bond) Dr. to voyage, or to goods exported.

RULE XXIX. When intelligence, with the account of sales, is received from your factor, advising that he had received and sold your goods, make Factor my account current Dr. to voyage to ——, for the net proceeds, and that whether the goods are sold for cash, credit, or part both; also make Voyage to ——, Cr. by factor my account current, for net proceeds. W. and J. Nov. 8. Received account sales from C. Leroi, of the net proceeds of the cargo consigned to him.

Expl. 24. As the cargo was consigned to C. Leroi, for your account, so he becomes your debtor, whenever he advises of its arrival and sales; therefore you must make Charles Leroi, my account cur-

rent Dr. to voyage to Bourdeaux, for the net proceeds; and Voyage to Bourdeaux Cr. by C. Leroi my account current, for net proceeds.

NOTE 26. When the ship or goods arrive, make Goods received Dr. to voyage from —, also Voyage from —, Cr. by the goods. W. and J. Sept. 3. Nov. 18.

NOTE 27. If the return cargo is sold on the wharf before the voyage is discharged in the books, make the *Buyer*, *Bills receivable*, *Cash*, or the *Things received*, Dr. to voyage from —, for the quantity and value; also Voyage from —, Cr. by the same, for the quantity and value. W. and J. Nov. 25. Dec. 15.

RULE XXX. When your factor makes a remittance in goods to you, having given you previous notice by account sales, or when the same arrives, make Voyage from ——, Dr. to factor my account current, for cost and charges of the cargo, per invoice; also Factor my account current Cr. by voyage from ——, for the same sum. W. and J. Sept. 3. Nov. 12.

NOTE 28. A factor is the person employed by the merchant.

RULE XXXI. When your factor, for goods consigned to him, remits to you a bill, payable at single or double usance, or any other time after date or sight, upon getting the bill accepted, make *Bills receivable*, stating on whom drawn, Dr. to factor my account current, for value of the bill; also Factor my account current Cr. by *bills receivable*. W. and J. Dec. 6.

NOTE 29. When the payment of the bill is received, make Cash Dr. to bills receivable; and Bills receivable Cr. by Cash. Dec. 8.

RULE XXXII. When you have goods consigned to you by your employer, on which you have paid charges, as freight, duties, &c.; make Employer his account of goods Dr. to Cash, stating for what; and Cash Cr. by employer's account of goods, for the same sum. W. and J. March 1. Paid freight on Henry Lee's tobacco.

Expl. 25. As you have the tobacco in your own hands, you need only make Henry Lee's account of tobacco Dr. to Cash; and Cash Cr. by H. Lee's account of tobacco, for the charges.

NOTE 30. When there is but one kind of goods, name it as in H. Lee's account of tobacco.

NOTE 31. Employer is the person who employs the merchant to transact business for him.

NOTE 32. Factorage comprises three things, 1. The receiving of the employer's goods. 2. Selling them, 3. Returns made for them.

Rule XXXIII. When goods consigned to you by your employer are sold for cash, make Cash Dr. to Employer his account of goods, for the sum received; and employer his account of goods Cr. by Cash for the same sum. W. and J. March 14 and 24.

Expl. 26. As the Dr. and Cr. applied to employer's account of goods admit the same varieties as proper trade, therefore no further explanation is necessary.

Note 33. When you sell your employer's goods, for a bill, make Bills receivable Dr. to employer his account of goods; and Employer's account of goods, specifying the price and quantity, Cr. by bills receivable, for the bill. W. and J. March 4.

Rule XXXIV. When your employer's goods are all sold, balance his account of goods, that is, charge Employer's account of goods Dr. to *Sundries*; viz. to *Cash*, for any charges paid by you and not yet booked; and to *Commission account*, for your commission; and to Employer his account current, for net proceeds; also make Employer's account current Cr. by his account goods for net proceeds, and Commission account Cr. by his account of goods, for commission. W. and J. March 30. Leger, H. Lee's account tobacco.

Rule XXXV. When you remit money to your employer, make Employer his account current Dr. to Cash; and Cash Cr. by employer's account current. W. and J. March 31.

Rule XXXVI. When your employer draws a bill on you, payable at usance, which you accept, make Employer's account current Dr. to bills payable, for value of the bill; and Bills payable Cr. by employer's account current, for the acceptance. W. and J. Aug. 25.

Rule XXXVII. When you buy up goods on credit, and ship them off by order for your employer, make Employer his account current Dr. to sundries; viz. to *seller* or *sellers*, for prime cost of the goods, to *Cash*, for charges, as custom, ensurance, and to Profit and Loss, for your commission; also each particular article Cr. by employer his account current. W. and J. Oct. 9. Vender Effingin of Amsterdam, &c.

Expl. 27. As the goods were shipped for the account and risk of V. Effingin and not your own, so whether they arrive safe or not, you must make V. Effingin his account current Dr. to sundries for the whole cost; and each article, when entered in the books as in this case, otherwise the seller, must be made Cr. for its respective value.

Rule XXXVIII. When you buy up goods for cash and ship them off to your employer, make Employer's account current Dr. to *sundries;* viz. to *Cash*, for prime cost and charges paid, and to *Profit* and *Loss*, for your commission.

Note 34. If you procure drawback or bounty, as this belongs to your employer, make *Cash* Dr. to employer his account current.

Note 35. If you receive money, bill or bond, at the custom-house, by bounty or drawback, make *Cash*, *Custom-House debentures*, or *Custom-house bonds*, Dr. to employer's account current.

Rule XXXIX. When goods in company are bought on credit, make two entries; first, make Goods in Co. (naming partner) Dr. to the seller, for the value of the goods bought; and the Seller Cr. by the goods bought in Co.; secondly, make each Partner his account current Dr. to his account in Co. for his respective share; also each Partner his account current Cr. by his account in Co. for his respective share. W. and J. Nov. 30. Bought of R. Means pot ashes in Co. with D. Whitman and self, each half.

Expl 28. As the ashes is in Co. you must first make ashes in Co. with D. Whitman and self, each half, Dr. to R. Means, for the quantity and value; also make R. Means Cr. by ashes in Co. with D. Whitman and self, each half, for the same sum.

Secondly, As you have a partner, make his Account current Dr. to his account in Co for his half of ashes; also your Partner's Account in Co. Cr. by his account current for the same sum.

Note 36. Goods in Co. or Voyage in Co. are debited for all charges paid upon them, and credited for every article of profit.

Note 37. Partner's account current shows what partner owes to the company, or the company to him; instead of which some use "partner's account proper."

Note 38. When you receive partner's share of goods, or cash for the goods bought in Co. make *cash* Dr. to partner his account current for the sum received; and Partner's account current Cr. by cash, for the same. June 21. Dec. 2.

Note 39. In paying for goods bought, or receiving payment for goods sold in Co. or Voyage in Co. the entries are the same as in proper trade.

Note 40. When you pay partner his share of net proceeds, make Partner's account in Co. Dr. to cash; and cash Cr. by partner's account in Co for the same. Dec. 4, 5.

Note 41. After goods are brought into partnership there is no further occasion for second entries, as some merchants practice; and the entries not only as it respects payments, but in every other transaction will generally, under similar circumstances, be the same as in proper trade.

Rule XL. When goods in Co. are sold for cash, make cash Dr. to goods in Co. (naming partner,) and goods in Co. Cr. by cash. W. and J. Dec. 2.

Note 42. When goods are bought in Co. and each partner pays his share in ready money, or if he bring in his own share of goods; make, Goods in Co. Dr. to sundries; viz. To *Cash*, or to *Goods*, for your share, and to each partner's account in Co. for his share.

Note 43. If the goods shipped have been formerly brought into Company, make *Voyage to*——, Dr. to sundries viz.

To *goods in Co.* for their value.
To *Cash*; for shipping charges.

Rule XLI. When goods in company are all sold off, balance the said account, that is charge Goods in Company, Dr. to sundries; viz. to *Cash*, for all charges not yet booked; to *Commission account*, for your commission; to each partner's *account in Company*, for his share of gain, and to *Profit and Loss*, for your share; also make sundries; viz. *Cash*, for charges not yet booked, commission account for your commission, Partner's account in Co. for his share of gain, and *Profit and Loss*, for your share of gain, Cr. by goods in company. See Leger, ashes in Co. with D. Whitman and Self; also voyage to Copenhagen in Co. with S. Dean and Self.

Rule XLII. When goods are bought on credit in Company, and shipped off, make two entries, viz. First, make Voyage in Co. Dr. to sundries, viz. *To seller or sellers*, for the value of the goods, *to Cash* for shipping and other charges; also make *Sellers* Cr. by voyage, for the value of goods, and *Cash* Cr. by voyage for charges; Secondly, make *each Partner his account current* Dr. to *his account in Co.* for his share of goods bought in Co. also Partner's Account in Co. Cr. by his account current, for his share of goods bought in Co. W. and J. June 20.

Expl. 29. Shipping goods in Co. is so much like bringing goods into company that attention to Rule XXXIX and others respecting "goods in Co." will be sufficient explanation respecting Voyage in Co.

Note 44. The entries, upon the advice and returns of the factor are the same as in proper trade.

Rule XLIII. When you receive the account sales from your factor, or receive returns of the goods in Co. consigned to him, make Factor our account current Dr. to voyage in Co. to ——, for the net proceeds; also Voyage

in Co. to —— (the place) Cr. by the factor our account current, for the same sum. W. and J. Nov. 6.

RULE XLIV. When cash is remitted by factor, make Cash Dr. to factor our account current; and Factor our account current Cr. by cash; for the same sum. W. and J Dec. 18.

RULE XLV. When you receive a bill or note for goods sold, make *Bills receivable*, Dr. to the buyer; and the Buyer Cr. by bills receivable, for the same. March 24. December 26.

DIRECTIONS FOR WRITING IN THE JOURNAL.

1. In a simple entry, the Debtor should be first named, then the Creditor, all in one line; after which the *narration* or cause of the entry, concisely and intelligibly expressed in one line, or more if necessary. Thus.

Joseph Brigham Dr. to Port wine,
For 5 hhds. at $55 per hhd. $275
Journal Feb. 21.

2. In a complex entry, let the sundry debtors or creditors be written in the first line, and expressed by the word "Sundries," with the sum total short extended, all in one line, under which let each of the several Crs. or Drs. with their respective sums be subjoined, each in a line by itself, which being added must be carried to the money columns; Thus, Broadcloth Dr. to Sundries $1750

For 500 yds. at $3,50
To cash, paid in part - - $875
— Winslow Lamb, for the rest - 875

Journal February 22. 1750
Sundries Dr. to Richard Lakeman $12100.
Fish merchantable, at $3,50—3400 quintals $11900
Oil, at $10 per barrel—20 barrels 200

Journal April 15. 12100

N. B. Every transaction of the Waste-book, thus entered is called a "Journal *post* or *entry*."

For example, see J. February 12, "Joseph Brigham" is called the *Dr* —"Port-wine" is the *Cr.*—The words "Joseph Brigham Dr. to Port-wine" is called the *entry*, and the words which follow, the *narration*.

When two or more persons or things are included in the same account they are expressed by the term "Sundries," or "Sundry accounts."

A simple entry is that which has only one Dr. or one Cr. as Cash Dr. to rum. Journal January 7.

A complex entry is either when one Dr. has two or more Crs. as Broadcloth Dr. to Sundries, or when two or more Crs. have only one Dr. as,

Sundries Dr. to Richard Lakeman,

or when several Drs. have several Crs. and then the entry is said to be complex in both terms. In such cases of complex posts, it is preferable to make two separate Journal entries, so that the first may have only one Cr. and the second only one Dr. This mode will prevent the confusion attending a single entry, and avoid the improper ambiguous, titles of "Sundries Dr. to Sundries."

Waste April 4.

Bartered with Robert Means 18 cwt. sugar *a* $12,50 per cwt. $225
120 gals. rum *a* $1,25 150
—— $375

For 20 casks of pot Ashes
45 2 4 lb. net *a* $4,94 $\frac{6}{51}$ per cwt. 225
500 yds. tow cloth *a* ,25 125
—— 350

Journal Entry April 4.

Sundries Dr. to Robert Means $375.
Ashes, 45 2 4 lb. net *a* $4,94 $\frac{6}{51}$ $225
Tow cloth, 500 yds. *a* ,25 125
Received in Barter. —— $350

Robert Means Dr. to Sundries $375.
To sugar 18 cwt. *a* $12,25 $225
To rum, 120 gals. *a* $1,25 150
Delivered in barter. —— $375

NOTE 1. In complex entries the sum total should be short-extended, and annexed to the word "Sundries."

2. In mentioning the several Drs. and Crs. the Crs. have the word "*To*" written before them, but the Drs. are expressed without any word prefixed. See preceding Journal entry.

POSTING THE JOURNAL.

The first Journal entry contains the substance of the Inventory, which is divided into two parts; viz.

1. All the money on hand, the goods, notes, or bills receivable, furniture, houses, lands, ships, debts due by bond or mortgage, accounts, and every other kind of property which the merchant possesses. The difference of these two parts shows the merchant's net stock, or how much he is worth after all his debts are paid. The first entry is "*Sundries Dr. to Stock.*"

The particular Drs. are, *Cash*, *Goods*, *Bills receivable*, due to him, and the *Persons* indebted to him.

2. The second entry is made, "*Stock Dr. to Sundries.*"

The particular Crs. are *the Persons*, to whom the merchant stands indebted, *Bills payable* accepted by him payable to others.

NOTE 1. *Stock* is a term used to represent the merchant or owner of the books.

2. The Debtors and Creditors should be written in large round hand, or text, both for ornament and distinction; and the figures of reference to the folio, much smaller than those of the date or sums.

LEGER.

The Leger is the merchant's principal book, to which the several transactions, dispersed through the Waste-book, but collected and prepared by the Journal entries of the titles with the relation of Dr. and Cr. are transferred each to its proper account.

The Leger is ruled in the same manner as in single entry, with the exception, that in this, inner columns are ruled in accounts of goods, and a folio column both on the Dr. and Cr. sides, for references to the folio, where the corresponding Leger entry of each article is made; for in the method of double entry, every article is twice entered in the Leger; viz. on the Dr. side of one account, and again on the Cr. side of some other account, so that the figures have a mutual reference from one to the other, which also greatly facilitate the labor of examining the accounts.

In posting the Leger, the following circumstances must be carefully observed.

On the Dr. side must be written,

1. The date, in the first and 2d left hand columns.
2. The Journal folio, in the 3d column.
3. Each creditor title, the cause of the entry, in the 4th do.
4. The transaction, belonging to the title, in 4th do.

5. The quantity &c. } *in account of goods*, in inner col-
6. The quality &c. } umns, ruled within the 4th do.
7. The Leger folio of the creditor, in the 5th do.
8. The amount in dollars and cents, in the 6th and 7th do.

On the Cr. side must be written,

1. The date, in 1st and 2d columns.
2. The Journal folio, in 3d do.
3. Each debtor title, the cause of the entry, in the 4th do.
4. The transaction belonging to the Leger title, in the 4th do.
5. The quantity &c. } in inner columns ruled in accounts
6. The quality &c. } of goods, in the 4th column.
7. The Leger folio of the Debtor, in the 5th do.
8. The amount in dols. and cents, in 6th and 7th do.

NOTE. Besides the seven columns, there should be other inner columns, ruled between 3d and 5th, for number, weight, measure, mark, exchange &c, when these are considered.

In filling up the Leger, assign a sufficient space for each account, in the order hereafter arranged, beginning with *Stock*, &c.

The titles of the accounts are written over the account, with *Dr.* prefixed on the left hand page, and Cr. annexed on the right; below which are the articles with the word "*To*" prefixed on the Dr. side and "*By*" on the Cr. side.

Upon the margin are recorded the dates of the articles in two small columns allotted for that purpose, and one for a reference to the Journal folio.

The titles are inserted in the index under their initials with the folio reference, as soon as they are written in the Leger.

In entering the Dr. article, write on the line the name of the Cr. with the word "*To*" prefixed, giving a short narrative of the transaction, and inserting the quantity and price, as directed above.

In entering the Cr. article, write the name of the Dr. with the word "*By*" prefixed, observing the circumstances mentioned in posting the Leger. This being done turn to the Journal, and in the folio columns, for the Dr. and Cr. of the account, insert the figures, which refer to the Dr. and Cr. of the account just posted. Thus proceed till all the Journal is transferred to the Leger.

The accounts in the Leger should be arranged according to their importance. The common order is the same, in which they stand in the Journal. This, however, is not

essential, but is the most regular method, and the most convenient for scholars.

The following is the arrangement adopted in this treatise.

1. Stock,
2. Cash,
3. Bills receivable,
4. Bills payable,
5. Profit and Loss,
6. Houses, lands, ships, and other possessions,
7. Personal accounts,
8. Commission,
9. Expense account,
10. Voyages to and from,

To which may be added Balance, and Interest account.

The preceding accounts may be distinguished under three general kinds, viz.

I. *Real,* which in the Leger is particularised by the titles,

1. Cash, i. e. all the ready money.
2. Goods general and particular; in my own hands for my own account.
3. Voyage to; when consigned to another for my account.
4. Such a person his account of goods; when in my own hands for another's account.
5. Goods in Co. with ——; when under my direction for self and others.
6. Bills receivable: when the bills are payable to me.
7. Bills payable; my own bills or notes payable to others.
8. House or land in such a place; for Houses and Lands.
9. Ship such a one; for ships.

NOTE. Such a person *his account of goods*; his *account current*, and his *account on time*, are used by the *Factor*, or person employed by the merchant; also such a person *my account of goods*; my (or our) *account current*, and my *account on time*, are used by the *employer*, or person who employs the merchant.

II. *Personal;* accounts with persons.

Title 1. *Such a person* (naming him); for a common personal account.

2. *Such a person his account;* an account current of another person's affairs transacted by me.
3. *Such a person my account;* an account current of my affairs done by another person.
4. *Such a person his account in Co.;* an account of the share a partner has in Co. under my direction.

III. *Fictitious or Imaginary;* that is accounts representing the Merchant himself, or the owner of the Books.

Title 1. Stock; that is, the Merchant.

2. Profit and Loss; the general account of the merchant's gains and losses.

3. Commission; the particular charges the merchant has made as factor for another.
4. Expense Account; the particular charges he has been at in the course of his business, house expenses, &c.
5. Interest; the gain or loss the merchant has made by interest. This account may as well be kept with that of Profit and Loss.

RULES FOR DEBITING, CREDITING AND BALANCING ACCOUNTS IN THE LEGER.

1. *Cash* is debited for all the money on hand, at the commencement of business, also for all sums received afterwards. It is credited for all money paid out, and, at closing the books, is credited "By balance," for the excess of the debit above the credit; which is the amount of the money on hand. See Leger, Cash. page 2.

If the money remaining on hand should not agree with this sum, an error exists in the account, which must be sought after and corrected.

2. *Goods.* The accounts of goods have inner columns for the quantities, &c.: See Leger, Broadcloth, Linen, &c.

At opening the books all the goods on hand as by the inventory, also those purchased afterwards, are entered on the Dr. side of their respective accounts; and goods sold, on the Cr. side, with the quantities of both entered in the inner columns, and their values in the outer.

All money expended on goods is debited, and all advantages arising from them are credited.

If no part of the goods are sold, credit the account "By balance," for the whole sum on the Dr. side.

If the sums in the inner columns on the Dr. and Cr. sides are equal, the goods are all sold, and then the balance of the money columns will exhibit the gain or loss; therefore debit the account "To Profit and Loss," for the gain, or credit it "By Profit and Loss," for the loss.

If the credit exceeds the debit, it is gain; if the debit is the greater, it is loss.

If the sum of the inner column on the Dr. side is the greater, part of the goods remain unsold; their value at the prime cost must be added to the sum on the credit side to ascertain the gain or loss. First, credit the account "By balance," for what remains unsold; Secondly, close the account, afterwards, with "Profit and Loss," for the gain or loss.

The merchant may, at any time, know what goods he has on hand without the laborious task of taking an account of stock, that is, by weighing or measuring the goods, by comparing the inner columns of the *account of goods*, of the Dr. and Cr. sides.

3. *Voyage to or from ;* **This account is debited for the prime cost and charges of the cargo, and credited "by factor my account current," or the amount of net proceeds, ascertained by the account sales received from the factor, or by the returns made by him. See Leger ; Voyage to Bourdeaux. p. 10.**

If the account of sales is not received, credit the account "By balance" for the total of the Dr. side.

If the account of sales is received, the account is credited "By the factor, my account current," and the account is closed "By Profit and Loss," for the difference between the Dr. and Cr. sides. See Leger, Voyage from Oporto. p. 12.

If goods or bills are received in return for the net proceeds, the account of voyage from —— is credited "By the amount of said return," and is closed "By Profit and Loss." See Leger, Voyage from Bourdeaux. p. 11.

4. *Such a person, his account of goods ;* **This account is debited for all the charges on the goods, paid by you (the factor) ; and credited by the sales made of them.**

If the sales are finished, and no account kept on time, debit employer his account of goods to sundries ; viz. to *cash*, for charges &c. to *commission*, for your commission ; to *employer his account current*, for the net proceeds, which is ascertained by subtracting all the charges from the amount of sales. See Leger, Henry Lee's account of tobacco. p. 3.

If the sales are not finished, close the account by a double balance, when the account is kept in the Leger.

5. *Goods in Company ;* **The Dr. side of this account contains the prime cost, with all the charges and your commission ; the Cr. side all the sales, or disposal of the goods. The difference between the Dr. and Cr. sides is the gain or loss, which is to be divided among partners.**

If the sales are finished, the account is closed with each partner his account in Co. for his share of net gain, and Profit and Loss, for your share. See Leger, Ashes in Co. with D. Whitman. p. 12..

Note. Voyage in Co. or ship in Co. are in their nature similar to goods in Co. and are closed in the same manner. See Leger, Voyage to Copenhagen in Co. with S. Dean. p. 10.

6. *Bills receivable ;* **This account contains, on the Dr. side, the bills payable to the merchant ; the Cr. side contains the payments he has received, or the disposal of the bills in payment. The account is closed by "Balance," for the bills remaining unpaid. See Leger, Bills receivable. p. 2.**

7. *Bills payable*, **or notes, drafts accepted by the merchant, payable to others, are credited and the payments**

he has made are debited. The account is closed "By balance," for those which are unpaid. See Leger, Bills payable. p. 2.

8. *Houses, Lands and Ships;* These accounts are debited for their prime cost, or with all charges, as taxes, repairs &c.; and credited for the profits, as rents, freight &c. received.

If the houses, lands &c. are sold in whole, or in part, the amount of sales is credited. The balance, after valuing at prime cost what remains unsold, exclusive of charges, shows the gain or loss. The account is closed "By Profit and Loss," for the remaining difference.

If any property remains on hand at the time of balancing the account, the value of it, at prime cost, is credited, and in such case, the balance shows the gain or loss, as the Dr. or Cr. side is the greater.

9. *Personal accounts;* The Dr. side contains the charges against the merchant, the Cr. his charges against others. These accounts are debited and credited as they stand Dr. and Cr. in the Journal. If the Dr. side is less than the Cr. the difference is a debt due by the merchant, therefore, debit the account "To balance due to him;" if the Cr. side is less than the Dr. the difference is a debt due by him to the merchant, therefore, Cr. the account "*By balance due to me.*"

If both sides are alike, the account closes itself. See Leger, Personal accounts.

10. *Such a person his account current;* the Dr. side contains your charges against your employer with all the expenses paid on his account; the Cr. side contains what you (being his factor) have received for his account. See Leger, Lee's account current. p. 8.

When you balance the Leger without settling with your employer or furnishing him with his account current, close the account with balance, or a double balance, without entering your *commission*, *interest*, *postage*, &c.

If the Cr. side is the greater, the difference is a debt due to your employer; if the Dr. side is the greater, the difference is a debt due by the employer to you.

When you forward employer's account current, and settle with him, debit his account *to commission account*, for your commission; to *cash*, for charges, &c. and then close the account with "Balance."

See the form of an account current to be sent to your employer, without the corresponding Drs. and Crs. of the Leger account, N. VII.

11. *Such a person my account current;* The Dr. side contains your charges against the factor, or what he has received for your account, or the remittances you have

made to him; the Cr. side contains what he has paid for your account, and the disposal of your goods, and his remittances to you.

If the Dr. side is the greater the difference is a debt due by the factor to the merchant; if the Cr. side is the greater, the difference is a debt due by the merchant to the factor.

If the two sides of this account are equal, the debts between you and your factor are cleared, and the account closes itself.

12 *Such a person his account in Co.* Partner's account in Co. contains on the Cr. side partner's share of the capital, with his share of gain at the close of sales, the Dr. side contains partner's share of net proceeds, with his share of loss, if any. See Leger, D. Whitman, his account in Co. p. 12.

If returns are fully made this account closes itself; but if no returns are made or made, in part only, it is closed with "balance." This account may be closed with partner's account current, if that, at closing the Leger, has its sides unequal.

13. *Stock account;* This account contains on the Dr. side, the amount of debts due by the merchant, according to his Inventory when he commenced business; the Cr. side contains the amount of ready money, goods, debts &c. belonging to him at that time.

The balance shows what his net stock is at the commencement of business; or in case of bankruptcy how much he is deficient.

Nothing more is entered on this account, till the closing of the books, when the "*balance*" of the Profit and Loss account is transferred to it, crediting the profit and debiting the loss.

The difference between the debit and credit shows the merchant's net stock at the time of closing the books, when it is made Dr. "*To Balance.*" See Leger, Stock. p. 1.

14. *Profit and Loss;* This account is credited for every article of gain upon bargains or goods, during the course of trade; and is debited for every article, delivered for which nothing is expected to be received as an equivalent; also for all losses on bargains or goods.

The balance will exhibit the net gain or loss. since the commencement of business; and is closed "To or By Stock." See Leger, Profit and Loss account. p. 3.

15. *Commission;* This account is credited for all gains which the merchant has by commission on buying and selling goods for others; the Dr. side is commonly empty.

The account is closed by "Profit and Loss." See Leger, Commission account. p. 9.

16. *Expense account;* This account is debited for all charges the merchant has paid for men's wages, &c. and is closed by "Profit and Loss" for the difference of the Dr. and Cr. sides. See Leger, expense account, p. 10.

17. *Interest;* This account is debited for sums the merchant pays for interest, and credited for what interest he has received. It is closed by being debited to, or credited by "Profit and Loss," for the difference of the Dr. and Cr. sides.

18. *Balance;* This account is debited for all that is due to the merchant, and credited for all that is due by him to others. The difference between the Dr. and Cr. sides is the merchant's net stock or estate, at closing the books; and, consequently, the entry brought from "*Stock account,*" will make the sides of the *Balance account* equal, that is, it is closed "By stock," brought to it. See p. 12.

OF POINTING AND CORRECTING THE LEGER.

Before the Leger can be balanced the several books must be perfectly correct. Two methods may be used to ascertain their correctness; viz. by *pointing the books*, or by forming a monthly or general *trial balance*. The Book-keeper may make use of such marks in pointing as may be most convenient, which, however, should be done with a lead pencil, that they may be rubbed out when all the corrections are completed.

First. Compare the Journal with the Waste-book, and see if every article is correctly posted and the sums cast up right. Correct each mistake as you proceed, making the correction on the article itself, if possible; otherwise there refer it to the next convenient place, where the article must be entered anew and the mistake mentioned.

If no mistake is found in the article, or when you have corrected one, make a mark on the left-hand margin directly against the article, denoting that it is examined and posted into the Journal correctly. Proceed in the same manner through the Waste and Journal.

Proceed in the same manner to compare the Journal and Leger, but with greater care, as the Leger is more liable to mistakes, which may arise from the following causes, viz.

1. The article may have been wholly omitted.

2. It may have been twice posted.
3. A wrong account may have been debited or credited.
4. A debit or a credit may have been omitted.
5. The Dr. may have been carried to the Cr. or the Cr. to the Dr. side.
6. An article may have been carried to two Drs. or to two Crs. sides.
7. The sum may have been added or carried out wrong.

A mistake arising from any of the preceding causes must be carefully corrected before a balance of the books can be made.

If an article is found to be correct, set a mark in the Leger, at the right-hand of the sum, and another in the Journal at the left-hand of the folio column of Dr. and Cr. denoting, that the article is examined and found to be correct.

To preserve neatness in the books, and to avoid any alteration which may have the appearance of a fraudulent intention, you must neither erase, nor cross any article in correcting mistakes. If any article is omitted, supply it by a proper entry, adding the word "omitted."

If the entry was made on a wrong title, or account, put it in its proper place, and set the sum on the contrary side of the wrong account, saying, "To" or "By error," on the article of such a date on the other side.

If the sum carried out is less than it should be, debit or credit the account on the same side; saying, "To or By" the same Dr. or Cr. for the difference, naming the month, date, and referring to the folio column.

If the sum set down is greater than it should be, place the excess on the contrary side; saying, "To or By error," on such an article on the other side.

TRIAL BALANCE.

The sum total of the Dr. side of the Leger, must be equal to that of the Cr. To prove this, form a "*Trial Balance.*" See the form annexed to the Leger.

Insert in the first and second columns of the trial balance the sum total of each account in the Leger, except those accounts which close themselves. Subtract the less side from the greater of each account, and set the difference in the third or fourth columns of the trial balance, as it may properly belong, and at the same time inserting with pencil mark, the difference on the less side of the ac-

count in the Leger; which being added will balance, that is, will make both sides equal, at closing the books.

Add up the third and fourth columns of the trial balance, and if the sums agree, the Leger is proved to be correct; otherwise the books cannot be brought to a balance, till the error is corrected.

The correctness of the Leger being thus proved, the closing of it remains to be done, which may be thus performed.

1. Form a Profit and Loss sheet, like the one annexed to the Leger.

2. Take from the Leger, or the trial balance, all the accounts which close with *Profit and Loss*, and enter the balance of each on its respective Dr. and Cr. side of the Profit and Loss sheet; and to the Profit and Loss sheet add the debits and credits of the Profit and Loss account.

3. Add up both sides and subtract the less from the greater, the balance will exhibit the gain, which must be debited if the Cr. side be the greater, "*To stock for net gain*," and will balance both sides of the Profit and Loss sheet, in case no error is committed.

Transcribe the Profit and Loss sheet into the Waste book, and from that, by the usual method into the Journal and Leger.

The next thing to be done is to make a "*Balance account*," similar in form to the one following the Profit and Loss sheet.

Take from the Leger, or trial balance, all the accounts which close with "*Balance*," except that of *Stock*, which will be taken from the Dr. side of that account in the Leger when the sides of the balance sheet are to be added up; and must be carried to the Cr. side of the balance sheet. This will make both sides equal, if there is no error.

The next thing to be done is to transfer the "Balance sheet" to the Journal, by making "*Balance account Dr. to Sundries*," taking the particulars from the Dr. of the Balance sheet; also by making "*Sundries Drs. to Balance account*," taking the particulars from the Cr. side of the Balance sheet, including the stock account. See J. p. 13.

Each balance must then be transferred to its proper account in the Leger, inserting in the column of the Journal the number of reference to the folio in the Leger.

OF CLOSING THE ACCOUNTS IN THE LEGER.

Having added up the money columns on the Dr. and Cr. sides as before directed, make both sides equal by adding the difference of the two sides to the less; and thus proceed with cash account in the Leger, and the accounts will be closed.

In forming a new set of Books, make out an inventory in the Waste-book from the balance account of the Leger. The entries in the new Journal will be "*Sundries Dr. to Stock;*" the particular debtors being taken from the Dr. side of the "*balance account.*" Also, "*Stock Dr. to Sundries;*" the particular creditors being taken from the Cr. side of the "*balance account.*"

Thus by the Balance of the Leger will be found, 1. What stock there is to begin another set of books. 2. What the gain or loss has been since the commencement of trade; and from the balance sheet, which is an account formed with the Dr. and Cr. the stock is ascertained. The gains and losses are found in the account of Profit and Loss; the several articles transferred into the accounts of "*Stock*" and "*Profit and Loss,*" are found by balancing or closing every account in the Leger.

Some accounts balance of themselves; some are closed with "*balance*" only, others with "*Profit and Loss*" only; Balance, also Profit and Loss are closed with "*Stock;*" and Stock balances of itself, in case no errors are committed, which is the best proof of the correctness of the books.

Boston, January 1, 1817.

J. F.		$.	C.
1	**Inventory of the estate of Thomas Russell, merchant.**		
	Ready money, deposited in the Union Bank	$4000	
	House in Hanover-street, value - - -	2500	
	Land in the county of Washington, in the Province of Maine, 750 acres, *a* ,75 -	562,50	
	Ship Massachusetts, value - - - - -	7000	
	Household furniture - - - - - - -	1500	
	Jacob Thomson's note, dated Nov. 10 last, payable to my order, at 6 months $350		
	David Jones' note, dated Dec. 3, last, payable to my order, at 3 months 410		
		760	
	Broadcloth, 250 yds. *a* $3,50 per yd. - -	875	
	Linen, 400 yds. *a* ,80 - - - - - - -	320	
	Port-wine, 7 hhds. *a* $45 per hhd. - - -	315	
	Sugar, 20 hhds. w'g. 240 cwt. *a* $10,50 pr. cwt.	2520	
	Rum, 12 puncheons, *a* $125 per pun. -	1500	
	Thomas Lamson, merchant, Boston, owes me	400	
	Amos Locke, carpenter, Salem, owes me	275	
			22527 50
	,,		
1	**List of debts and notes owed by the said Thomas Russell.**		
	To James Lewis, merchant, Boston, - -	$140	
	L. Samson, mer. Boston, payable on dem'd.	800	
	James Munson, merchant, Boston, payable on demand - - - - -	2050	
	Joseph Franklin, merchant, Boston, payable on demand, ...	1500	
			4490
	2		
1	**Sold Charles Lee, at 5 months, 72 cwt. sugar,** *a* $12,50 per cwt. - - - - - - - Rule I.		900
	7		
1	**Sold for cash, 9 puncheons rum, *a* $135 per pun.** Rule II.		1215
	12		
1	**Paid James Lewis, in full - - - -** Rule X.		140
	15		
1	**Bo't for cash, 8 hhds. port-wine, *a* $42 pr. hhd.** Rule VI.		336
	18		
1	**Bought of Andrew Newman, 1000 yds. linen,** *a* ,70 per yd. - - - - - - - Rule VII.		700

Boston, January 19, 1817.

J. F.		$.	C.
1	**Bought for cash,** 84 cwt. sugar, *a* $10,72,6$\frac{4}{21}$ per cwt. - - - - - - - - - Rule VI.	901	
	20		
1	**Bartered** 84 cwt. sugar, *a* $12 per cwt. for 4032 lb. coffee, *a* ,25 per lb. - - - - Rule XXV.	1008	
	24		
2	**Paid Joseph Franklin, in full** - - - - - Rule X.	1500	
	,,		
2	**Paid James Munson, in full** - - - - - - Rule X.	2050	
	27		
2	**Sold A. Eastman my 750 acres of land,** *a* $1,10 per acre, in payment of which I have received cash, in part, - - - - - - $350 And his bill, at 11 months, with interest, for balance - - - - - - - - 475 Rule IV.	825	
	28		
2	**Paid Lemuel Samson, in full** - - - - - Rule X.	800	
	29		
2	**Received from Thomas Lamson, in full** - Rule XIV.	400	
	31		
2	**Received from Amos Locke, in full** - - Rule XIV.	275	
	February 2		
2	**Lent Samuel Tyler, on bond,** at 6 per cent. Rule XI.	2000	
	5		
2	**Rec'd from J. Thomson,** payment of his note Rule XVIII.	350	
	10		
2	**Sold for cash** 400 yds. linen, *a* $1,10 per yd. Rule II.	440	
	12		
2	**Sold J. Brigham,** 5 hhds. port-wine, *a* $55 per hhd. - - - - - - - - - Rule I.	275	
	15		
2	**Bo't for cash,** 220 bbls. of flour, *a* $8,75 pr. bbl. Rule VI.	1925	

Boston, February 18, 1817.

J. F.		$.	C.
2	**B't of D. Whitman, 1250 lb. hyson tea, *a* $1,25** Rule VII.	1562	50
	20		
2	**Paid W. Hart, for repairs on the ship Mass.** Rule XII.	53	20
	22		
2	**Bo't of W. Lamb 500 yds. broadcloth, *a* $3,50** For which I paid cash in part . . $875 Balance due him is . . . . 875 Rule VIII.	1750	
	25		
3	**Sold to Nye Freeman 600 yds. linen, *a* $1,20** for which he has given me a bill on A. Young, payable in 3 months . . . . . . Rule V.	720	
	26		
3	**Discounted with the Massachusetts Bank, A. Young's note, at 3 months . . . $720** . . . . . discount . . . 11,16 Net sum received . . . . . Rule XX. See Pract. Arith. p. 153. Bank Dis.	708	84
	28		
3	**Effected Ensurance, at the Union Ensurance Office, on the Massachusetts from Boston to London and from thence to Boston, $6000 at 3½ per cent premium . . . . . $210** . . . . . Policy . . . . . ,75 Rule XXIII. See Pract. Arith. p. 148.	210	75
	March 1		
3	**Henry Lee of Norfolk, Vir. has consigned to me by the brig Favorite, Capt. C. Hunt, 15 hhds. tobacco, for sale on his account; on which I have paid freight *a* $2,75 per hhd. . . . .** Rule XXXII.	41	25
	4		
3	**Sold W. Paterson, per bill payable in 3 months.** 4 hhds. of Henry Lee's tobacco, weighing as follows; viz. No. 1. 10 3 14lb. tare 145 lb. 2. 11 2 16 160 3. 9 3 24 135 4. 10 0 27 140 42 2 25 lb. 570 lb. is 4215 lb. net, *a* $6,80 per 100 lb. . . Rule XXXIII. N. 33. See Pract. Arith. p. 110.	286	62
	7		
3	**Sold for cash 100 bbls. flour, *a* $10,25 . . .** Rule II.	1025	

Boston, March 10, 1817.

J. F.		$.	C.
3	**Paid truckage, on H. Lee's tobacco, 15 hhds.** @ ,75 per hhd. Rule XXXII.	11	25
	14		
3	**Sold for cash 8 hhds. of H. Lee's tobacco, w'g.** as follows; viz. No. 5. 8 2 13 lb. grpss. tare 135 lb. 6. 9 1 140 7. 10 0 14 138 8. 8 3 15 145 9. 7 3 23 125 10. 9 1 13 132 11. 10 0 14 140 12. 8 2 14 130. 72 3 22 lb. 1085 lb. is 7085 lb. net, @ $6,50 per 100 lb. Rule XXXIII. See Pract. Arith. p. 110 Tare & Tret.	460	52,5
	18		
3	**Paid for repairs on house in Hanover-street,** Rule XII.	44	37
	19		
3	**Bought for cash 120 gals. rum @ $1,25 pr. gal.** Rule VI.	150	
	20		
3	**Sold to R. Means, 150 cwt. sugar, @ $12,25** Rule I.	1837	50
	24		
3	**Received of Robert Means, his note, to my** order, at 9 months, with interest, in full for 150 wt. sugar . . . . . Rule XLV.	1837	50
	,,		
3	**Sold for cash 3 hhds. H. Lee's tobacco, w'g. as** follows; viz. No. 13. 9 2 12 lb. gross. Tare 146 lb. 14. 8 3 27 138 15. 10 1 13 148 28 3 24 432 lb. makes 2812 lb. net, @ $6,90 per 100 lb. Rule XXXIII. See Pract. Arith. p. 110.	194	02,8
	27		
4	**Paid for weighing and other incidental** charges attending the delivery of Henry Lee's tobacco . . . . . Rule XXXII.	5	50
	30		
4	**Paid storage of H. Lee's tobacco, 15 hhds.** Rule XXXII.	10	50

Boston, March 30, 1817.

J. F.		$.	C.
4	**Furnished H. Lee with account sales of his** 15 hhds. tobacco, amounting to $941,17,3		
	My commission on the same *a* 2½ per cent. 25,88,2		
	The net proceeds 946,79,1		
	Rule XXXIV. See Pract. Arith. p. 147.	872	67,3
	31		
4	**Remitted H. Lee, by mail, in bank bills of U. S.** Rule XXXV.	500	
	April 4		
4	**Bartered with R. Means, 18 cwt. sugar** *a* $12,50 225		
	And 120 gallons rum *a* $1,25 . 150		
		375	
	For 20 casks pot ashes, each weighing 2 2 qrs. gross—tare 25 lb. pr. cask is 45 2 4 lb. net, *a* $4,94, $\frac{9}{11}$ per cwt. $225		
	500 yds. tow cloth, *a* ,25 . . . 125		
	Rule XXVI.	350	
	6		
4	**Rec'd from D. Jones, pay't of his note $410**		
	Interest for 30 days 2,05		
	Rule XVI. N. 12.	412	05
	7		
4	**Paid expenses, this quarter, for men's wages** and other incidental charges . . .	120	25
	Rule XIII.		
	10		
4	**Chartered the brig Huntress, Capt. S. Sawyer,** for a voyage to Bourdeaux, and laded her with the following goods; viz.		
	2200 bushels corn, bo't of C. Lee, *a* $1 $2200		
	2200 ditto wheat, bo't of C. Lee, *a* $1,25 2750		
	 4950		
	230 bags coffee, bought of E. Nichols & Son, weighing 16400 lb. *a* ,25 . . 4600		
	Cash paid for dunnage, &c. . . . 175,20		
	paid shipping charges 155		
		9880	20
	Consigned to C. Lerei, Supercargo for sale & returns. Rule XXVIII.		
	27		
4	**Made Ensurance, at the Union Ensurance** Office, Boston, on the cargo of the brig Huntress from Boston to Bourdeaux, valued $9880,20		
	a 3½ per cent. premium . . . $370,50,7		
	Policy 75		
		371	25,7
	Rule XXIII. See Pract. Arith. p. 148.		

Boston, April 12, 1817.

J. F.		$.	C.
5	**Granted to C. Lee my note, dated 10th inst.,** at 60 days, for 2200 bushels corn and 2200 do. wheat Rule XIX.	4950	
	15		
5	**Bought of Richard Lakeman of Ipswich,** 3400 quintals of merchantable fish, *a* $3,50 $11900 20 barrels oil, *a* $10 . . . . . 200 12100 For which I paid him cash . . . $6050 And my note, at 60 days for the rest 6050 Rule IX. Exp. 9.	12100	
	18		
5	**Paid Andrew Newman, in full** . . . . . Rule X.	700	
	20		
5	**Received from Joseph Brigham, cash in full** for 5 hhds. port wine.	275	
	Rule XIV.		
	24		
5	**Paid David Whitman in full for 1250 lb. tea** purchased of him Feb. 18.	1562	50
	Rule X.		
	26		
5	**Paid Winslow Lamb in full** . . . . . Rule X.	875	
	28		
5	**Bought of Joseph Turrel for cash 340 pairs** men's shoes, *a* $,90 per pair . . $306 522 pairs women's coloured ditto, *a* $1,20 626,40 120 ditto boots, *a* $3 . . . . 360 Rule VI.	1292	40
	May 4		
5	**Received payment of William Paterson's bill** Rule XVIII.	286	62
	5		
5	**Bo't for cash 8000 white oak staves** *a* $35 pr. m. Rule VI.	280	
	8		
5	**Shipped on board the General Hamilton for** Oporto, Capt. A. Delano, and consigned to F. Alvardo & Co. for sales and returns, on my own account and risk, 3400 quintals of merchantable fish *a* $3,50 $11900 8000 white oak staves *a* $35 . . . 280 Paid shipping charges . . . . . 11,50 Rule XXVIII.	12191	50

Boston, May 15, 1817.

J. F.		$.	C.
6	**Effected Insurance at the Union Insurance** Office, Boston, on the cargo of the General Hamilton, from Boston to Oporto and thence to Boston, valued $10000 *a* 5¼ pr. cent. prem. $525 Policy . . . . ,75 Rule XXIII. See Pract. Arith. p. 148.	525	75
	18		
6	**Bought for cash 3 pipes gin, containing,** No. 1. 134 gals. 7 out 2. 129 8 3. 133 5 — — 396 20 making 376 gals. *a* $1,55 pr. gal. . . . Rule VI.	582	80
	20		
6	**Bought of R. Means, at 30 days, 20 casks of** pearl-ashes, each containing 2 1 26 lb. net, making 49 2 16 lb. *a* $6 per cwt. . . . Rule VII.	297	85,7
	24		
6	**Granted to R. Means my note dated 20th inst.** payable in 30 days, for 49 2 16 lb. pearl-ashes. Rule XIX.	297	85,7
	31		
6	**Shipped on board the Galen, Capt. S. Turner,** for London, and consigned to said Capt. for sales and returns, the following goods; viz.		
S. T. No. 1*a*17	17 casks of Ashes, pot, marked as in margin, w'g. 45 2 4 lb. net *a* $4,94 $\frac{8}{10}$ pr. cwt. $225		
S. T. No. 1*a*20	20 do. of Ashes, pearl, marked as in margin, weighing 49 2 16 lb. net, *a* $6 pr. cwt. 297,85,7		
	Paid shipping charges . . . 15,25 Rule XXVII.	538	10,7
	June 5		
6	**Sold for cash 20 bbls. oil, *a* $12,50 per bl.** Rule II.	250	
	10		
6	**Received from Charles Lee, cash in full .** Rule XIV.	900	
	,,		
6	**Paid Charles Lee my note, dated April 10th,** at 60 days. . . . . Rule XVIII. No. 15.	4950	
	18		
6	**Sold for cash 2 punch. rum, *a* $132 pr. pun.** Rule II.	264	

Boston, June 20, 1817.

J. F.		$.	C.
6	**Shipped on board the Mary-Ann, Jas. Scot** Master, bound to Copenhagen—the following goods as marked in the margin; viz.		
Bale J. V.	1 bale broadcloth containing 3000 yds. bo't of Amasa Goodhue *a* $3,50 per yd. $10500		
Hhds. 1 to 20 J. V.	20 hhds. tobacco containing 240 cwt. bought of Thomas Mackay, *a* $5 1200		
	Paid shipping charges . . . 35		
		11735	
	Which goods are consigned to Jacob Vantorff, merchant at Copenhagen, for the joint concern of Samuel Dean and self, each half, . .	11735	
	Rule XLII.		
	21		
6	**Received from S. Dean his half of the value** of Voyage in Co. to Copenhagen . .	5867	50
	Rule XXXIX N. 38.		
	22		
7	**Sold for cash 3266 lb. coffee,** *a* ,28 per lb.	914	48
	Rule II.		
	25		
7	**Shipped on board the Pacific, Capt. L. Davis,** for New-Orleans,		
	340 pairs men's shoes, *a* ,90 . . $306		
	522 ditto women's coloured ditto, *a* $1,20 626,40		
	120 ditto boots, *a* $3 360		
	paid shipping charges, ... 10,20		
		1302	60
	Consigned to Kingman Turrel, merchant there, for sale and returns on my own account and risk, with orders to invest the net proceeds in produce.		
	Rule XXVII.		
	30		
7	**Sold James Wilson 1 puncheon rum . .**	132	
	Rule I.		
	July 1		
7	**Paid house expenses, and other charges this** quarter.	119	24
	Rule XIII.		
	2		
7	**Received from S. Tyler in part on his bond**	495	
	Rule XVII.		
	3		
7	**Received of R. Means, balance in barter**	25	
	Rule XIV.		
	6		
7	**Paid Richard Lakeman my bill,** *a* 90 days	6050	
	Rule XVIII. N. 15.		

Boston, July 10, 1817.

D.	P.		$.	C.
7		**Paid Robert Means my bill, *a* 30 days . .** Rule XVIII. N. 15.	297	85,7
		12		
7		**Paid Thos. Mackay in full for tobacco . .** Rule X.	1200	
		15		
7		**Bought of Rufus Perkins 2500 lb. coffee** *a* 22 cts. . . . . Rule VII.	550	
		20		
7		**Paid Amasa Goodhue in full for broadcloth** Rule X.	10500	
		25		
7		**Sold for cash, 675 lb. hyson tea, *a* $1,50** Rule II.	1012	50
		"		
7		Sold for cash, 500 yds. tow cloth, *a* 25 cts. Rule II.	125	
		30		
7		**Rec'd Interest on W. Paterson's bill, 41 days** Rule XV.	1	96
		August 1		
8		**Granted Rufus Perkins my note, *a* 30 days** Rule XIX.	550	
		8		
8		**Paid E. Nichols & Son cash in full for 18400** lb. coffee . . . . . Rule X.	4600	
		15		
8		**Henry Lee of Norfolk, Virginia, has drawn** on me in favor of Charles Lee, for $120 at 10 days after sight, which draft I have this day accepted Rule XXXVI.	120	
		18		
8		**Sold my house in Hanover-street, for cash** Rule II. N. 2.	3000	
		19		
8		**Sold for cash my household furniture . . .** Rule II. N. 2.	2300	
		20		
8		**Remitted Henry Lee, the balance of his act.** Rule XXXV.	226	79,1
		25		
8		**Paid my acceptance of H. Lee's draft in fa**vor of C. Lee. . . . . Rule XVIII. Note 15.	120	

Boston, August 28, 1817.

J. P.		$.	C.
8	**Kingman Turrel, writes me of the safe arrival** at New-Orleans, of the Pacific, with my goods; the net proceeds of which amounted to $1405,80—that he had invested the same in cotton, which he had shipped by return of the Pacific, on my account and risk, 9 bales weighing 6390 lb. *a* ,22 per lb.	1405	80
	Rule XXIX.		
	31		
8	**Sold for cash 120 barrels flour,** *a* $11,75 . .	1410	
	Rule II.		
	Sept. 1		
8	**Paid Rufus Perkins my bill,** *a* **30 days . . .**	550	
	Rule XVIII. N. 15.		
	3		
8	**The Pacific, Lemuel Davis, has arrived from** New-Orleans, and brought me in return the net proceeds of my goods, remitted by K. Turrel, merchant there, 9 bales cotton, weighing 6390 lb. *a* ,22 pr. lb.	1405	80
	Rule XXX.		
	4		
8	**Paid for freight and other charges for my** goods in the Pacific from New-Orleans. . . .	134	50
	Rule XXIV.		
	12		
8	**Sold for cash on the wharf at auction my 9** bales of cotton, weighing 6390 lb. *a* ,29½ per lb.	1885	05
	Rule II. & XXIX. N. 27.		
	27		
8	**Sold W. Lamb 575 lb. tea** *a* **$1,45 per lb.** for which I received cash in part . $578,75 the rest at 60 days 255	833	75
	Rule III.		
	30		
8	**Received from Samuel Tyler $14 on his bond.**	14	
	Rule XVII.		
	Oct. 1		
9	**Paid for men's wages and other incidental** expenses this quarter, ending 30 ult. . . .	127	44
	Rule XIII.		
	5		
9	**Sold A. Newman 3 pipes gin, 376 gallons,** *a* $1,80, at 90 days.	676	80
	Rule I.		

Boston, October 9, 1817.

J. F.		$.	C
9	**Bought of James Wilson for account of Vender** Effingin, Amsterdam, at 30 days, 10 hhds. tobacco, weighing as follows; viz.		
V.E. No. 1a10	No. 1. 1340 lb. gross—tare 84 lb.		
	2. 1574 90		
	Shipped on board 3. 1394 89		
	the Mary-Ann, 4. 1504 96		
	Capt. Hoffman, 5. 1479 88		
	for said Effingin's 6. 1584 87		
	account and risk. 7. 1498 90		
	8. 1640 100		
	9. 1549 99		
	10. 1584 98		
	15146 lb. 921 lb.		
	921		
	14225lb.net a$4pr.100lb. $569		
	Shipping charges 21,10		
	Commission a 5½ per cent. 28,45		
	Rule XXXVII.	618	55
	10		
9	**Granted to James Wilson my note, dated** 9 inst. at 30 days, for 10 hhds. tobacco, bought of him for account of Vender Effingin, for . . .	569	
	Rule XIX.		
	15		
9	**Received advice from Francisco Alvardo and** Co. of the safe arrival of the General Hamilton, at Oporto, that they had received my goods, and had sold the same for cash, amounting, after deducting freight, duties, &c. to 14637,800 reas—Exchange a $1,25 per milrea; that they had ship'd by the return of the General Hamilton for Boston, the net proceeds in port wine, viz. 18297½ gals. a800 reas pr gal.	18297	25
	Rule XXIX. See Pract. Arith. p. 170. Exchange.		
	20		
9	**Received from S. Tyler, $350 on his bond.** Rule XVII.	350	
	25		
9	**Sold for cash** 400 yds. linen, a ,95 per yd. . Rule II.	380	
	30		
9	**S'd J. Wilson** 750 yds. b'dcloth a $4,25 for which I received my note pay'ble to him $569 Cash for the rest, ... 2618,50		
	Rule IV.	3187	50

Boston, November 1, 1817.

J. F.		$.	C.
9	**The Galen, Capt. Turner, is arrived from** London, and brings me in return for my goods, 6 Pianos Fortes, valued *a* £181,12,2¾ Ster. . . Rule XXIX. N. 26. See Pract. Arith. p. 160.	807	16
	5		
9	**Entered at the Custom-House my Fortes** Pianos, and paid duties, freight, &c. . . Rule XXIV.	115	50
	6		
9	**Received advice from Jacob Vantorff, of Co**penhagen, that he had received by the Mary-Ann, Capt. Scot, the goods consigned to him for the joint concern of Samuel Dean and self, amounting to 14786 rix dollars and 50 skillings, Exchange 100 cts. per rix dollar. . . . . Rule XLIII. See Pract. Arith. p. 471.	14786	48
	8		
9	**Received intelligence from Charles Leroi,** Supercargo of the brig Huntress, who advises his safe arrival at Bourdeaux, that he had sold the cargo, amounting to 74101 livres 10 sols, Exchange 20 cents per livre; that he had shipped by return of the Huntress the net proceeds in brandy; viz. $11856\frac{6}{25}$ gals. *a* 6 liv. 5 sols per gal. . . Rule XXIX. See Pract. Arith. p. 167.	14820	30
	12		
10	**The brig Huntress, Capt. S. Sawyer, is ar**rived from Bourdeaux, and brought the net proceeds of my adventure, viz. $11856\frac{6}{25}$ gals. brandy, *a* 6 liv. 5 sols per gal. . . . . Rule XXX.	14820	30
	17		
10	**Entered, at the Custom-House, my goods from** Bourdeaux, and paid duties, freight, &c. . . Rule XXIV.	784	50
	18		
10	**The General Hamilton, Capt. Delano, is ar**rived from Oporto, and brought returns of my goods, viz. 18297¼ gallons port wine, *a* 800 reas per gal. Rule XXX.	18297	25
	19		
10	**Paid at the Custom-House, duties and other** charges for the General Hamilton from Oporto Rule XXIV.	1010	40
	20		
10	**Received from Samuel Tyler $870 on his** bond. . . . . Rule XVII.	870	

Boston, November 25, 1817.

J. F.		$.	C.
10	**S'd. for cash on the wharf my 18297¼ gallons** port wine, *a* $1,76 per gal. being the net proceeds of my adventure to Oporto by the General Hamilton. . . . . Rule XXIX. N. 27.	32203	16
	27		
10	**Received of Jones & Pennman for freight of** the ship Massachusetts. . . . . Rule XXII.	5054	39
	28		
10	**Received from Winslow Lamb in full . .** Rule XIV.	255	
	,,		
10	**Paid reimbursements on the Massachusetts** to Europe . . . . . Rule XII.	1208	20
	30		
10	**Bought of R. Means, for account of D. Whit-**man and self in Co. each half, 340 cwt. pot ashes, *a* $6 per cwt. on demand, myself having the disposal of the same. . . . . Rule XXXIX.	2040	
	December 1		
10	**Paid R. Means in full for our 340 cwt. pot** ashes, in Co. with D. Whitman and self. . . Rule X.	2040	
	2		
10	**Sold for cash our 340 cwt. pot ashes, in Co.** with D. Whitman and self, *a* $6,75 per cwt. . . Rule XL.	2295	
	,,		
10	**Received from D. Whitman his half share of** ashes bought of R. Means. . . . . Rule XXXIX. N. 33.	1020	
	3		
11	**Paid charges on ashes in Co.** . . . . Rule XXXIX. N. 36.	86	70
	4		
11	**Adjusted accounts with David Whitman in** Co. and paid him in part of net proceeds on ashes in Co. . . . . Rule XXXIX. N. 40.	1020	
	5		
11	**Adjusted accounts with S. Dean, of voyage** in Co. to Copenhagen, and paid him in part of net proceeds. . . . . Rule XXXIX. N. 40.	5867	50

Boston, December 6, 1817.

J. F.		$.	C.
11	**Received from Vender Effingin his remittance**, per bill on R. Perkins, Boston, for amount of goods shipped by his order, on board the Mary-Ann, Capt. Hoffman, amounting to 1855 gilders 13 stivers, Exchange 40 cents per gilder. . .	742	26
	Rule XXXI. See Pract. Arith. p. 166.		
	8		
11	**Received from Rufus Perkins, payment of** Vender Effingin's bill.	742	26
	Rule XXXI. N. 29.		
	9		
11	**Sold for cash 10 hhds. port wine, *a* $51,50**	515	
	Rule II.		
	12		
11	**Sold for cash 3266 lb. coffee *a* ,29 per lb.**	947	14
	Rule I.		
	13		
11	**Received from James Wilson in full for 1** puncheon of rum	132	
	Rule XIV.		
	14		
11	**Andrew Newman is become a bankrupt, and** owes me $676,80		
	He has compounded with his creditors, *a* ,38 on a dollar, which I have received in full of his debt. 257,18,4		
		676	80
	Balance allowed him 419,61,6		
	Rule XXI. See Pract. Arith. p. 127.		
	15		
11	**Sold at auction my brandy by brig Huntress** from Bourdeaux—Amount of sales $26676		
	From which deduct commission $1\frac{1}{2}$ } 2 per ct. 535,52		
	United States duty . . $\frac{1}{2}$ }		
		26140	48
	Received in cash . . $13070,24		
	Bills receivable { James Henderson's note, at 90 days, endorsed by William Ponsby $6535,12		
	T. Henshaw's note, at 90 days, endorsed by Tho. Benson . 6535,12		
	Rule XXXIX. N. 27. $26140,48		
	16		
11	**Sold for cash 3 Pianos Fortes *a* $175 . . .**	525	
	Rule II.		

Boston, December 17, 1817.

J. F.		$.	C.
11	**Taken for the use of my family 1 Piano Forte** Rule VI. N. 4.	210	
	18		
11	**Received from Jacob Vantorff, merchant, at** Copenhagen, the net proceeds of goods consigned to him for the joint concern of Samuel Dean and self, each half, by the Mary-Ann, Capt. Scot, amounting to 14786 rix dollars and 50 skillings, Exchange 100 cents per rix dollar. . . . Rule XLIV. See Pract. Arith. p. 171.	14786	43
	20		
12	**At the request of Robert Means, I have accommodated him by a renewal of his note, due** this day, for 4 months longer, . . $1837,50 His bill renewed for the same. . . . Rule XVIII. obs.	1837	50
	21		
12	**Received from Samuel Tyler, the balance** due on his bond. . . . . $271 Amount of Interest by partial payments 86,34,4 Rule XVI. See Pract. Arith. p. 144.	357	34,4
	25		
12	**Sold Vancouver & Sons the ship Massachusetts, at 4 months** . . . . . . Rule I.	6975	
	26		
12	**Received from Vancouver & Sons their bill** payable in 4 months, for the ship Massachusetts Rule XLV.	6975	
	27		
12	**Sold for cash, 2 Piano Fortes, a $210** . . . Rule II.	420	
	28		
12	**Rec'd. payment of A. Eastman's bill** $475 Interest on the same for 11 months . 26,12,5 Rule XVI. N. 12.	501	12,5
	30		
12	**Paid for men's wages, and other expenses** this quarter. . . . . . Rule XIII.	132	40
	31		
12	**S'd. for cash, household furniture, 1 P. Forte** Rule II.	220	
	31		
12	**Received from Robert Means, Interest on his** note, for 9 months and 6 days . . . Rule XV.	84	50

Boston, December 31, 1817.

J. F.			$.	C.
12	**Profit & Loss to be debited for sundries,**			
	Expense account since Jan. 1, $499,33			
	For men's wages and other charges . . .	120,25		
	ditto	119,24		
	ditto	127,44		
	ditto	132,40		
			499	33
	"			
13	**Profit & Loss to be credited for sundries,**			
	articles of gain, since Jan. 1, .	$42916,15,8		
	For House, in Hanover-street . . .	$455,63		
	Land, in Washington County . .	262,50		
	Ship Massachusetts	3557,24		
	Household Furniture	810		
	Broadcloth	562,50		
	Linen	520		
	Port wine	139		
	Sugar	549,50		
	Rum	111		
	Gin	94		
	Coffee	303,62		
	Flour	510		
	Tea	283,75		
	Oil	59		
	Piano Fortes	347,84		
	Commission	54,33,2		
	Voyage to Bourdeaux . .	4568,84,3		
	——— Oporto	5580		
	——— London . . .	153,55,3		
	——— New-Orleans . .	103,20		
	—— from New-Orleans . .	344,75		
	Vender Effingin, Amsterdam . .	123,71		
	Voyage from Bourdeaux . . .	10535,68		
	——— Oporto . .	12895,51		
			42916	15,8
	"			
13	**Profit & Loss to be finally debited per Stock,**			
	For net gain since January 1, . . .		43796	92,1
	"			
13	**Balance account to be debited for Stock,**			
	For net Stock		61334	42,1

END OF THE WASTE-BOOK.

Boston, January 1, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
	1	**Sundries Dr. to Stock $22527,50**		
1		Cash deposited in the Union Bank . $4000		
3		House in Hanover-street . . 2500		
3		Lands for 750 acres in County of Washington, P. of Maine, *a* ,75 per acre 562,50		
3		Ship Massachusetts . . . 7000		
3		Household furniture . . . 1500		
		Notes receivable,		
		J. Thomson's note, dated Nov. 10 last, payable to my order, at 6 months $350		
2		D. Jones' note, dated Dec. 3d last, payable to my order at 3 months, 410		
		——760		
4		Broadcloth 250 yds. *a* $3,50 per yd. 875		
4		Linen, 400 yards, *a* ,80 . . 320		
4		Port wine, 7 hhds. *a* $45 per hhd. 315		
4		Sugar, 20 hhds. w'g. 240 cwt. *a* $10,50 2520		
4		Rum, 12 puncheons, *a* $125 per pun. 1500		
4		T. Lamson, mer. Boston, owes me 400		
5		A. Locke, carpenter, Salem, owes me 275——	22527	50
		2		
1		**Stock Dr. to Sundries $4490**		
	5	To J. Lewis, mer. Boston, due to him $140		
	5	Lemuel Samson, mer. Boston, ditto 800		
	5	James Munson, mer. Boston, ditto 2050		
	5	Jos. Franklin, mer. Boston, ditto 1500——	4490	
		2		
7	4	**Charles Lee Dr. to sugar,**		
		For 72 cwt. *a* $12,50 per cwt. . .	900	
		7		
1	4	**Cash Dr. to rum,**		
		For 9 puncheons, *a* $135 per pun. . . .	1215	
		12		
5	1	**James Lewis Dr. to cash,**		
		Paid him in full	140	
		15		
4	1	**Port wine Dr. to cash,**		
		For 8 hhds. *a* $42 per hhd. . . .	336	
		18		
4	7	**Linen Dr. to Andrew Newman,**		
		For 1000 yards, *a* ,70 per yd. . . .	700	
		19		
4	1	**Sugar Dr. to cash,**		
		For 84 cwt. *a* $10,72,6/11 per cwt. . .	901	
		20		
5	4	**Coffee Dr. to sugar,**		
		Received 4032 lb. *a* ,25 per lb. in barter for 84 cwt. sugar, *a* $12 per cwt.	1008	

Boston, January 24, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
5	1	**Joseph Franklin Dr. to cash,**		
		Paid him in full	1500	
		——— " ———		
5	1	**James Monson Dr. to cash,**		
		Paid him in full	2050	
		——— 27 ———		
	3	**Sundries Dr. to land $825**		
1		Cash in part for 750 acres land $350		
2		Bills receivable, bill on A. Eastman, at 11 months, with interest, the rest 475		
			825	
		——— 28 ———		
5	1	**Lemuel Samson Dr. to cash,**		
		Paid him in full	800	
		——— 29 ———		
1	4	**Cash Dr. to Thomas Lamson,**		
		Received from him in full . . .	400	
		——— 31 ———		
1	5	**Cash Dr. to Amos Locke,**		
		Received from him in full . . .	275	
		——— *February* 2 ———		
7	1	**Samuel Tyler Dr. to cash,**		
		Lent him on bond, at 6 per cent. per an.	2000	
		——— 5 ———		
1	2	**Cash Dr. to bills receivable,**		
		Received from J. Thomson payment of his note	350	
		——— 10 ———		
1	4	**Cash Dr. to linen,**		
		For 400 yards *a* $1,10 per yd. . .	440	
		——— 12 ———		
7	4	**Joseph Brigham Dr. to port wine,**		
		For 5 hhds. *a* $55 per hhd. . . .	275	
		——— 15 ———		
5	1	**Flour Dr. to cash,**		
		For 220 barrels, *a* $8,75 per bbl. . .	1925	
		——— 18 ———		
6	8	**Tea Dr. to David Whitman,**		
		For 1250 lb. *a* $1,25 per lb. . .	1562	50
		——— 20 ———		
3	1	**Ship Massachusetts Dr. to cash,**		
		For repairs, paid to William Hart . .	53	20
		——— 22 ———		
4		**Broadcloth Dr. to sundries $1750**		
		For 500 yds. *a* $3,50 per yd.		
1		To cash, in part . . $875		
8		Winslow Lamb for rest . 875		
			1750	

Boston, February 25, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
2	4	**Bills receivable Dr. to linen,** For 600 yds. *a* $1,20 sold to Nye Freeman, for which I have received a bill on A. Young, due at 90 days	720	
		26		
	2	**Sundries Dr. to bills receivable, $720**		
1		Cash, rec'd. for A. Young's note, disc'd. $708,84		
3		Profit and Loss, discounted 3 mo. Inter. 11,16	720	
		28		
3	1	**Ship Massachusetts Dr. to cash,** For Insurance from Boston to London on $6000 at 3½ per cent. premium, . . . $210 Policy, ... ,75	210	75
		March 1		
8	1	**H. Lee's account of tobacco Dr. to cash,** Paid freight of 15 hhds. from Norfolk . .	41	25
		4		
2	8	**Bills receivable Dr. to H. Lee's ac't tobacco** Received William Paterson's bill *a* 3 months,	286	62
		7		
1	5	**Cash Dr. to flour,** For 100 barrels *a* $10,25	1025	
		10		
8	1	**Henry Lee's ac't. tobacco Dr. to cash,** Paid truckage 15 hhds. *a* ,75 per hhd. . .	11	25
		14		
1	8	**Cash Dr. to Henry Lee's ac't. tobacco,** For 8 hhds. as per Waste, wt. 7085 lb. net. .	460	52,
		18		
3	1	**House in Hanover-street, Dr. to cash,** Paid for repairs, ...	44	37
		19		
4	1	**Rum Dr. to cash,** For 120 gallons, *a* $1,25	150	
		20		
8	4	**Robert Means Dr. to sugar,** 150 cwt. *a* $12,25 per cwt.	1837	50
		24		
2	8	**Bills receivable Dr. to Robert Means,** Received his note, *a* 9 months, with interest,	1837	50
		,,		
1	8	**Cash Dr. to Henry Lee's tobacco,** For 3 hhds. wt. 2812 lb. net, *a* $6,90 per 100 lb.	194	02,8

Boston, March 27, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
8	1	**Henry Lee's ac't. tobacco Dr. to cash,**		
		Paid for weighing and other charges,	5	50
		30		
8	1	**Henry Lee's ac't. tobacco Dr. to cash,**		
		Paid storage,	10	50
		,,		
8		**H. L's ac't. tobac. Dr. to sund's. $872,67,3**		
	8	To his acc't. current for net proceeds, $846,79,1		
	9	Commission ac't. for my commission, 25,88,2		
			872	67,3
		31		
8	1	**H. Lee his account current Dr. to cash,**		
		Remitted him by mail in bank bills,	500	
		April 4		
8		**R. Means Dr. to sundries, $375**		
	4	Sugar, 18 cwt. *a* $12,50 $225		
	4	Rum, 120 gallons, *a* $1,25 150		
		Delivered in barter.	375	
	8	Sundries Dr. to Robert Means, $350		
	6	Ashes, pot, 45 2 4 lb. *a* $4,94½ $225		
	6	Tow cloth, 500 yds. *a* ,25 125		
		Received in barter.	350	
		6		
1		**Cash Dr. to sundries, $412,05**		
	2	To bills receivable, on D. Jones $410		
	3	Profit and Loss, for interest 30 days, 2,05		
			412	05
		,,		
10	1	**Expense account Dr. to cash,**		
		Paid men's wages, &c. this quarter,	120	25
		10		
10		**Voyage to Bour'x. Dr. to sund's. $9880,20**		
	7	To C. Lee, for 2200 bush. corn *a* $1 2200		
		ditto, 2200 do. wheat *a* $1,25 2750		
		4950		
	9	To E. Nichols & Son, for 230 bags coffee wt. 18400 lb. *a* ,25 per lb. 4600		
		Cash, for shipping charges, 330,20		
			9880	20
		By brig Huntress, consigned to C. Leroi, for sale and returns.		
		,,		
10	1	**Voyage to Bourdeaux Dr. to cash,**		
		Premium on the Huntress' cargo $9880,20		
		a 3¾ per cent. $370,50,7		
		Policy, ,75		
			371	25,7

Boston, April 12, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
7	2	**Charles Lee Dr. to bills payable,**		
		Granted him my note 10 inst. *a* 60 days, .	4950	
		15		
	8	**Sundries Dr. to R. Lakeman, $12100**		
6		Fish merch'ta. *a* $3,50 per quin. 3400 $11900		
6		Oil, *a* $10 per bbl. 20 barrels, . 200		
			12100	
8		Richard Lakeman Dr. to sundries, 12100		
	1	To cash, ... 6050		
	2	Bills payable, my note *a* 90 days, . 6050		
			12100	
		18		
7	1	**Andrew Newman Dr. to cash,**		
		Paid him in full.	700	
		20		
1	7	**Cash Dr. to Joseph Brigham,**		
		Received from him in full. . . .	275	
		24		
8	1	**David Whitman Dr. to cash,**		
		Paid him in full for 1250 lb. tea, *a* $1,25 .	1562	50
		26		
8	1	**Winslow Lamb Dr. to cash,**		
		Paid him, balance.	875	
		28		
	1	**Sundries Dr. to cash, $1292,40**		
6		Shoes, *a* ,90 340 pairs, . $306		
		ditto, *a* $1,20 522 ditto, . 626,40		
6		Boots, *a* $3 120 ditto, . 360		
			1292	40
		May 4		
1	2	**Cash Dr. to bills receivable,**		
		Received payment of William Paterson's bill,	286	62
		5		
7	1	**Staves Dr. to cash,**		
		For 8000 white oak, *a* $35 per M. . .	280	
		8		
10		**Voyage to Oporto Dr. to sund's. $12191,50**		
	6	To fish, 3400 quintals, *a* $3,50 . $11900		
	7	Staves, 8000 *a* $35 per M. . 280		
	1	[illegible] paid shipping charges, . 11,50		
			12191	50
		Shipped the above goods on board the General Hamilton, Capt. Amasa Delano, and consigned to Francisco Alvardo & Sons, merchants at Oporto, for sale and returns.		

Boston, May 15, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
10	1	**Voyage to Oporto Dr. to cash,** For premium on the General Hamilton's cargo,	525	75
		18		
5	1	**Gin Dr. to cash,** For 376 gals. *a* $1,55 per gal. . .	582	80
		20		
6	8	**Ashes, pearl, Dr. to Robert Means,** For 20 casks, wt. 49 2 16 lb. *a* $6 per cwt.	297	85,7
		24		
8	2	**Robert Means Dr. to bills payable,** For my note granted him for 30 days, .	297	85,7
		31		
10		**Voyage to London Dr. to sund's. $538,10,7**		
	6	To Ashes pot, 45 2 4 lb. *a* $4,94 per cwt. . . $225		
	1	Ashes pearl, 49 1 16 lb. *a* $6 297,85,7		
		Cash paid shipping charges, . 15,25	538	10,7
		Shipped on board the Galen, S. Turner master, for London, and to him consigned, for sale and returns, for my account and risk.		
		June 5		
1	6	**Cash Dr. to oil,** For 20 barrels *a* $12,50 per bar. . .	250	
		10		
1	7	**Cash Dr. to Charles Lee,** Received from him in full, . . .	900	
		,,		
2	1	**Bills payable, Dr. to cash,** P'd my note to C. Lee, dated April 10, at 60 days	4950	
		18		
1	4	**Cash Dr. to rum,** For 2 puncheons *a* $132 per puncheon, . .	264	
		20		
10		**Voyage to Copenhagen in Co. with S. Dean and self, each half, Dr. to sund's. $11735**		
9		To Amasa Goodhue, for 3000 yds. broadcloth, *a* $3,50 per yd. . . . $10500		
9		To Thomas Mackay, for 240 cwt. tobacco, *a* $5 per cwt. . . 1209		
1		Cash paid shipping charges, . . [redacted]	11735	
		Consigned to Jacob Vantorff, merchant there.		
9	9	Samuel Dean's account current Dr. to his account in Co. for half the above goods. . .	5867	50
		21		
1	9	**Cash Dr. to S. Dean his ac't. current,** For his half of voyage in Co. to Copenhagen, .	5867	50

Boston, June 22, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
1	5	**Cash Dr. to coffee,**		
		For 3266 lb. *a* ,28 per lb.	914	48
		25		
11		**Voy. to N.Orleans Dr. to sund's.** $1302,60		
	6	To Shoes men's, 340 pairs, *a* ,90 $306		
		do. women's 522 pairs, *a* $1,20 626,40		
	6	Boots, 120 pairs, *a* $360 360		
	1	Cash, paid shipping charges, 10,20		
			1302	60
		Consigned to Kingman Turrel, merchant there.		
		30		
9	4	**James Wilson Dr. to rum,**		
		For 1 puncheon, *a* $132	132	
		July 1		
10	1	**Expense ac't. Dr. to cash,**		
		Paid this quarter, for men's wages, &c.	119	24
		2		
1	7	**Cash Dr. to Samuel Tyler,**		
		Received from him in part, lent on bond,	495	
		3		
1	8	**Cash Dr. to Robert Means,**		
		Received from him, balance in barter,	25	
		6		
2	1	**Bills payable Dr. to cash,**		
		Paid to Richard Lakeman my bill,	6050	
		10		
2	1	**Bills payable Dr. to cash,**		
		Paid Robert Means my bill at 30 days,	297	85,7
		12		
9	1	**Thomas Mackay Dr. to cash,**		
		Paid him in full,	1200	
		15		
5	9	**Coffee Dr. to Rufus Perkins,**		
		For 2500 lb. *a* ,22 per lb.	550	
		20		
9	1	**Amasa Goodhue Dr. to cash,**		
		Paid him in full,	10500	
		25		
1	6	**Cash Dr. to tow cloth,**		
		For 500 yds. *a* ,25	125	
		,,		
1	6	**Cash Dr. to tea,**		
		For 675 lb. hyson, *a* $1,50	1012	50
		30		
1	3	**Cash Dr. to Profit and Loss,**		
		For interest on W. Paterson's note,	1	96

Boston, August 1, 1817.

Dr. L.	F.	Cr. L.	F.		$.	C.
9		2		**Rufus Perkins Dr. to bills payable,**		
				Paid my note *a* 30 days, . . .	550	
				8		
9		2		**E. Nichols & Son Dr. to cash,**		
				For 18400 lb. coffee, . . .	4600	
				15		
8		2		**H. Lee's ac't. cur't. Dr. to bills payable,**		
				Accepted his draft on me, at 10 days after sight,	120	
				18		
1		3		**Cash Dr. to house in Hanover-street,**	3000	
				19		
1		3		**Cash Dr. to household furniture,** . .	2300	
				20		
8		2		**Henry Lee's ac't. current Dr. to cash,**		
				Paid him balance in full of his account, . . .	226	79,1
				25		
2		2		**Bills payable Dr. to cash,**		
				Paid my acceptance to H. Lee, . . .	120	
				28		
12		11		**K. Turrel, my ac't. cur't. Dr. to voyage to New-Orleans,**		
				For net proceeds of goods consigned to him, .	1405	80
				31		
1		5		**Cash Dr. to flour,**		
				For 120 barrels, *a* $11,75 . .	1410	
				September 1		
2		2		**Bills payable Dr. to cash,**		
				For my bill to R. Perkins, *a* 30 days, . .	550	
				3		
11		12		**Voyage from New-Orleans Dr. to K. Turrel's account current,**		
				For 9 bales cotton, wt. 6390 lb. *a* ,22 per lb.	1405	80
				4		
11		2		**Voyage from New-Orleans Dr. to cash,**		
				Paid freight and other charges, . .	134	50
				12		
1		11		**Cash Dr. to voyage from New-Orleans,**		
				For 6390 lb. cotton, *a* ,29½ per lb. . .	1885	05
				27		
		6		**Sundries Dr. to tea, $833,75,**		
1				Cash in part, . . . $578,75		
8				Winslow Lamb rest at 60 days, . . 255		
					833	75
				30		
1		7		**Cash Dr. to S. Tyler, in part, lent on bond,**	14	

Boston, October 1, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
10	2	**Expense account Dr. to cash,**		
		Paid men's wages, &c. . .	127	44
		5		
7	5	**Andrew Newman Dr. to gin,**		
		For 376 gals. *a* $1,80, payable in 90 days, .	676	80
		9		
11		**Vender Effingin his account current Dr.**		
		to sundries, $618,55.		
	9	To J.W. 14225 lb. tobac. *a* $4 per 100 lb. $569		
	2	Cash, paid for shipping, . . . 21,10		
	9	Commission, for my commission, . . 28,45		
			618	55
		Shipped on board the Mary-Ann, Capt. Hoffman, for Amsterdam, per order, and for account and risk of said Effingin.		
		10		
9	2	**James Wilson Dr. to bills payable,**		
		For my note dated 9 inst. at 30 days, . .	569	
		15		
11	10	**Francisco Alvardo & Co. his ac't. cur't.**		
		Dr. to voyage to Oporto,		
		For net proceeds of goods consigned, . .	18297	25
		20		
1	7	**Cash Dr. to Samuel Tyler,**		
		Received in part, on bond, ...	350	
		25		
1	4	**Cash Dr. to linen,**		
		For 400 yds. *a* ,95	380	
		30		
	4	**Sundries Dr. to broadcloth, $3187,50**		
1		Cash, in part, . . . $2618,50		
2		Bills payable, my note *a* 90 days, . 569—	3187	50
		Nov. 1.		
7	10	**Piano Forte Dr. to voyage to London,**		
		For 6, valued at £181,12,2¾ sterling, . .	807	16
		5		
10	2	**Voyage to London Dr. to cash,**		
		Paid duties at the custom house and freight, .	115	50
		6		
11	10	**Jacob Vantorff our ac't. current Dr. to** voyage in Co. to Copenhagen,		
		For net proceeds, as per account of sales, amounting to 14786 rix dols. and 50 skillings, .	14786	48
		8		
11	10	**Charles Leroi my account current Dr. to** voyage to Bourdeaux,		
		For net proceeds per brig Huntress, amounting to 11856 $\frac{6}{25}$ gals. brandy, *a* 6 liv. 5 sols, . .	14820	30

Boston, November 12, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
11	11	**Voyage from Bourdeaux Dr. to C. Leroi** my account current, For net proceeds of voyage to Bourdeaux, .	14820	30
		13		
11	2	**Voyage from Bourdeaux Dr. to cash,** P'd duties at custom house and freight on brandy,	784	50
		18		
12	11	**Voyage f. Oporto Dr. to F. Alvardo & Co.** For net proceeds by the General Hamilton, 18297¼ gals. port wine, *a* 800 reas per gal.	18297	25
		19		
11	2	**Voyage from Oporto Dr. to cash,** Paid duties, freight, &c.	1010	40
		20		
1	7	**Cash Dr. to Samuel Tyler,** Received in part on his bond, . . .	870	
		25		
1	11	**Cash Dr. to voyage from Oporto,** For 18297¼ gals. port wine, *a* $1,76 . .	32203	16
		27		
1	3	**Cash Dr. to ship Massachusetts,** For freight from Europe, &c. . .	5054	39
		28		
1	8	**Cash Dr. to Winslow Lamb,** Received from him in full, ...	255	
		,,		
3	2	**Ship Massachusetts Dr. to cash,** Paid the Capt. for reimbursements, . .	1208	20
		30		
12	8	**Ashes in Co. with D. W. Dr. to R. Means,** For 340 cwt. ashes, pot, *a* $6, on demand, .	2040	
		. . . . .		
12	12	**David Whitman's account current Dr.** To his account in Co. for his half of the above-mentioned pot ashes, ...	1020	
		Dec. 1		
8	2	**Robert Means Dr. to cash,** Paid him in full for 340 cwt. pot ashes, bo't of him in Co. with D. Whitman and self, each half,	2040	
		2		
2	12	**Cash Dr. to ashes, in Co. with David** Whitman and self, For 340 cwt. *a* $6,75 per cwt.	2295	
		,,		
2	12	**Cash Dr. to D. Whitman, his ac't. cur't.** Received his half share of our 340 cwt. pot ashes,	1020	

Boston, December 8, 1817.

Cr. L. F.		$.	C.
2	**Ashes in Co. with David Whitman and self, each half, Dr. to cash,**		
	For charges on the same, ...	86	70
	4		
2	**David Whitman's ac't. in Co. Dr. to cash,**		
	P'd him in part for his share of net proc's on ashes,	1020	
	5		
2	**Sam. Dean's account in Co. Dr. to cash,**		
	Paid him in part for his share of net proceeds,	5867	50
	6		
11	**Bills rec'able Dr. to V. Effingin's ac't. enr.**		
	For bill remitted, in full for net proceeds, on R. P.	742	26
	8		
2	**Cash Dr. to bills receivable,**		
	To Vender Effingin's bill on Rufus Perkins, .	742	26
	9		
4	**Cash Dr. to port wine,**		
	For 10 hhds. *a* $51,50 per hhd. . . .	515	
	12		
5	**Cash Dr. to coffee,**		
	For 3266 lb. *a* ,29 per lb.	947	14
	13		
9	**Cash Dr. to James Wilson,**		
	For 1 puncheon rum, . . .	132	
	14		
7	**Sundries Dr. to A. Newman, $676,80,**		
	Cash, received in composition, . . $257,18,4		
	Profit and Loss—for balance, loss, . 419,61,6		
		676	80
	15		
11	Sundries Dr. to voyage fr. Bourdeaux, $26140,48		
	Cash, in part, for sales of brandy at auction, . D. 13070,24		
	Bills receivable, { James Henderson, for his note *a* 3 mo. endorsed by W. Ponsby, . . 6535,12		
	Thomas Henshaw's note, *a* 3 months, endorsed by Thos. Benson, . 6535,12		
		26140	48
	16		
7	**Cash Dr. to Piano Fortes,**		
	For 3 *a* $175, . . .	525	
	17		
7	**Household furniture Dr. to Piano Fortes,**		
	For 1 taken for family use, . . .	210	
	18		
11	**Cash Dr. to J. Vantorff our ac't. current,**		
	For net proceeds of goods consigned for the joint concern of Samuel Dean and self, .	14786	48

Boston, December 20, 1817.

Dr. L. F.	Cr. L. F.		$.	C.
8	2	**Robert Means Dr. to bills receivable,**		
		For his bill given up for renewal this day, .	1837	50
2	8	Bills receivable Dr. to Robert Means,		
		For his bill renewed for 4 months, . .	1837	50
		,,		
2		**Cash Dr. to sundries, $357,34,4**		
	7	To Samuel Tyler, for balance principal due on his bond, . . . $271		
	3	Profit and Loss, for interest, . 86,34,4		
			357	34,4
		25		
12	3	**Vancouver & Sons Dr. to ship Massa.**		
		For said ship, *a* 4 months, ...	6975	
		26		
2	12	**Bills receivable Dr. to Vancouver & Sons,**		
		For ship Massachusetts, *a* 4 months, .	6975	
		27		
2	7	**Cash Dr. to Piano Fortes,**		
		For 2 *a* $210, ...	420	
		28		
2		**Cash Dr. to sundries, $501,12,5**		
	2	Bills receivable, Abram Eastman's, . $475		
	3	Profit and Loss, for interest 11 mo. . 26,12,5		
			501	12,5
		30		
10	2	**Expense account Dr. to cash,**		
		For men's wages, &c. this quarter, . .	132	40
		,,		
2	3	**Cash Dr. to household furniture,**		
		For 1 Piano Forte, ...	220	
		,,		
2	3	**Cash Dr. to Profit and Loss,**		
		For interest on Robert Means' bill for 9 months and 6 days, ...	84	50
		31		
3		**Profit and Loss Dr. to sundries, $499,33**		
	10	To expense account for men's wages, &c.		
		$120,25		
	10	ditto, ... 119,24		
	10	ditto, ... 127,44		
	10	ditto, ... 132,40		
			499	33

Boston, December 31, 1817.

Dr. L. F.	Cr. L. F.			$.	C.
	3	**Sundries Dr. to Profit & Loss,**	$42916,15,8		
3		To House in Hanover-street,	$ 455,63		
3		Land in the Coun. of Washing'n.	262,50		
3		Ship Massachusetts,	3557,24		
3		Household furniture,	810		
4		Broadcloth,	562,50		
4		Linen,	520		
4		Port wine,	139		
4		Sugar,	589,50		
4		Rum,	111		
5		Gin,	94		
5		Coffee,	303,62		
5		Flour,	510		
6		Tea,	283,75		
6		Oil,	50		
7		Piano Fortes,	347,84		
9		Commission account,	54,33,2		
10		Voyage to Bourdeaux,	4568,84,3		
10		Oporto,	5580		
10		London,	153,55,3		
11		New-Orleans,	103,20		
11		Voyage from New-Orleans,	344,75		
11		Vender Effingin, of Amsterdam,	123,71		
11		Voyage from Bourdeaux,	10535,68		
12		Oporto,	12895,51		
				42916	15,8
		,,			
3	1	**Profit and Loss Dr. to stock,**			
		For net gain since January 1,		43796	92,1
		,,			
12		**Balance ac't. Dr. to sund's.**	$63444,31,1		
	2	To cash,	$41561,57,1		
	2	Bills receivable,	21882,74		
				63444	31,1
		,,			
	12	**Sundries Dr. to balance ac't.**	$63444,31,1		
9		Samuel Dean's ac't. in Co.	$1525,74		
12		D. Whitman's ac't. in Co.	84,15		
			1609,89		
1		Stock, net of my estate,	61834,42,1		
				63444	31,1
		,,			
1		**Stock Dr. to balance account,**			
	12	For net stock,		61834	42,1

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Dr. Stock Account,

1817.		J.F.		Cr. L.F.	$.	C.
Jan.	1	1	To sundries, as per Journal. . . .		4490	
Dec.	31	13	Balance, for net stock, . .	12	61834	42,1
					66324	42,1

Dr. Cash

1817.		1	To Stock on hand, . . .		4000	
Jan.	7	1	Rum, ...	4	1215	
	27	2	Lands in part, ...	3	350	
	29	2	Thomas Lamson, ...	4	400	
	31	2	Amos Locke, ...	5	275	
Feb.	5	2	Bills Receivable, on J. Thomson,	2	350	
	10	2	Linen, ...	4	440	
	26	3	Bills receivable, A. Young's disco'd.	2	708	84
Mar.	7	3	Flour, ...	5	1025	
	14	3	Henry Lee's ac't. tobacco, . .	8	460	52,5
	24	3	Henry Lee's ac't. tobacco, . .	8	194	02,8
April	6	4	Sundries for note on D. Jones & int.		412	05
	20	5	Joseph Brigham, ...	7	275	
May	4	5	Bills receivable, W. Paterson's note,	2	288	62
June	5	6	Oil, ...	6	250	
	10	6	Charles Lee, ...	7	900	
	18	6	Rum, ...	4	264	
	21	6	Samuel Dean, his ac't. current,	9	5867	50
	22	7	Coffee, ...	5	914	48
July	2	7	Samuel Tyler, in part, . . .	7	495	
	3	7	Robert Means, ...	8	25	
	25	7	Tow cloth, ...	6	125	
	25	7	Tea, hyson, ...	6	1012	50
	30	7	Profit and Loss, ...	3	1	96
Aug.	18	8	House in Hanover-street, .	3	3000	
	19	8	Household furniture, . .	3	2300	
	31	8	Flour, ...	5	1410	
Sept.	12	8	Voyage from New-Orleans, .	11	1885	05
	27	8	Tea, in part, ...	6	578	75
	30	8	Samuel Tyler, in part, . .	7	14	
Oct.	20	9	Samuel Tyler, in part, . .	7	350	
	25	9	Linen, ...	4	380	
	30	9	Broadcloth, in part, . .	4	2618	50
Nov.	20	10	Samuel Tyler, in part, . .	7	870	
	25	10	Voyage from Oporto, . . .	11	32203	16
	27	10	Ship Massachusetts, . . .	3	5054	39
	28	10	W. Lamb, in full, ...	8	255	
			Account transferred to folio 2d. . .		71166	35,3

Contra, Cr.

1817.		J.F.		Dr. L.F	$.	C.
Jan.	1	1	By sundries, as per Journal,		22527	50
Dec.	31	13	Profit and Loss for net gain,	3	43796	92,1
					66324	42,1

Account, Cr.

1817.						
	12	1	By James Lewis,	5	140	
Jan.	15	1	Port wine,	4	336	
	19	1	Sugar,	4	901	
	24	1	Joseph Franklin,	5	1500	
	24	2	James Munson,	5	2050	
	28	2	Lemuel Samson,	5	800	
Feb.	2	2	Samuel Tyler,	7	2000	
	15	2	Flour,	5	1925	
	20	2	Ship Massachusetts,	3	53	20
	22	2	Broadcloth, in part,	4	875	
	28	3	Ship Massachusetts,	3	210	75
Mar.	1	3	Henry Lee's ac't. tobacco, freight,	8	41	25
	10	3	Henry Lee's ac't. tobacco, truckage,	8	11	25
	18	3	House in Hanover-street,	3	44	37
	19	3	Rum,	4	150	
	27	4	Henry Lee's ac't. tobacco,	8	5	50
	30	4	Henry Lee's ac't.	8	10	50
	31	4	Henry Lee's ac't. current,	8	500	
April	6	4	Expense account,	10	120	25
	10	4	Voyage to Bourdeaux—Ensurance,	10	371	25,7
	10	4	ditto, Shipping charges,	10	330	20
	15	5	Richard Lakeman,	8	6050	
	18	5	Andrew Newman,	7	700	
	24	5	David Whitman,	8	1562	50
	26	5	Winslow Lamb,	8	875	
	28	5	Sundries, as per Journal,		1292	40
May	5	5	Staves,	7	280	
	8	5	Voyage to Oporto,	10	11	50
	15	6	ditto, for Ensurance,	10	525	75
	18	6	Gin,	5	582	80
	31	6	Voyage to London,	10	15	25
June	10	6	Bills payable, to Charles Lee,	2	4950	
	20	6	Voyage to Copenhagen,	10	35	
	25	7	Voyage to New-Orleans,	11	10	20
July	1	7	Expense account,	10	119	24
	6	7	Bills payable, to Richard Lakeman,	2	6050	
	10	7	Bills payable, to Robert Means,	2	297	85,7
	12	7	Thomas Mackay,	9	1200	
	20	7	Amasa Goodhue,	9	10500	
			Account transferred to folio 2d.		47433	02,4

Dr. Cash

1817.		J.F.		Cr. L.F.	$.	C.
			To account brought from folio 1.		71166	35,3
Dec.	2	10	Ashes in Co. with D. Whitman,	12	2295	
	2	10	D. Whitman's ac't. current,	12	1020	
	8	11	Bills receivable, R. Perkins,	2	742	26
	9	11	Port wine,	4	515	
	12	11	Coffee,	5	947	14
	13	11	James Wilson,	9	132	
	14	11	A. Newman,	7	257	18,4
	15	11	Voyage from Bourdeaux,	11	13070	24
	16	11	Piano Fortes,	7	525	
	18	11	J. Vantorff, our ac't. cur't.	11	14786	48
	20	12	Sundries, as per J.		357	34,4
	27	12	Piano Fortes,	7	420	
	28	12	Sundries, as per J.		501	12,5
	30	12	Household Furniture,	3	220	
	30	12	Profit & Loss, for interest,	3	84	50
					107039	62,6

Dr. Bills Receivable,

1817.						
Jan.	1	1	To Stock,		760	
	27	2	Lands, on Abram Eastman *a* 11 mo.	3	475	
Feb.	25	3	Linen, on Alexander Young, *a* 3 mo.	4	720	
Mar.	4	3	H. Lee's ac't. tobacco, for W. P's bill,	8	286	62
	24	3	Sugar, on Robert Means, *a* 9 months,	8	1837	50
Dec.	6	11	V. Effingin's ac't. cur. on R. Perkins,	11	742	26
	15	11	Voyage f. Bourdeaux, J. Henderson's	11	6535	12
	15	11	ditto, T. Henshaw's note, *a* 3 mo.	11	6535	12
	20	12	R. Means, renewed bill, *a* 4 mo.	8	1837	50
	26	12	Vancouver & Sons' bill, *a* 4 mo.	12	6975	
					26704	12

Dr. Bills Payable,

1817.						
June	10	6	To cash paid Charles Lee,	1	4950	
July	6	7	ditto Richard Lakeman,	1	6050	
	10	7	ditto Robert Means,	1	297	85,7
Aug.	25	8	ditto my acceptance to H. Lee,	2	120	
Sept.	1	8	ditto to Rufus Perkins,	2	550	
Oct.	30	9	Cash, James Wilson,	9	569	
					12536	85,7

Account, Cr.

1817.		J.F.		Dr. L.F.	$.	C.
			By account brought from folio 1. .		47433	02,4
Aug.	8	8	E. Nichols & Son, ...	9	4600	
	20	8	Henry Lee, ...	8	226	79,1
	25	8	Bills payable, H. Lee, . . .	2	120	
Sept.	1	8	Bills payable, R. Perkins, . .	2	550	
	4	8	Voyage from New-Orleans, .	11	134	50
Oct.	1	9	Expense account, . . .	10	127	44
	9	9	V. Effingin, voyage to Amsterdam,	11	21	10
Nov.	5	9	Voyage to London, . . .	10	115	50
	13	10	Voyage to Bourdeaux, . . .	11	784	50
	19	10	Voyage from Oporto, . . .	12	1010	40
	28	10	Ship Massachusetts, . . .	3	1208	20
Dec.	1	10	Rob. Means, ...	8	2040	
	3	11	Ashes in Co. with D. Whitman,	12	86	70
	4	11	D. Whitman, his ac't. in Co. .	12	1020	
	5	11	S. Dean's ac't. in Co. . .	9	5367	50
	30	12	Expense account, . . .	10	132	40
	31	12	Balance due to me, . .		41561	57,1
					107039	62,6

Cr.

1817.						
Feb.	5	2	By cash, Jacob Thomson's note, . .	1	350	
	26	3	Sundries, as per Journal, . .		720	
April	6	4	David Jones, ...	1	410	
May	4	5	William Paterson, . . .	1	286	62
Dec.	8	11	Rufus Perkins, ...	2	742	26
	20	12	R. Means, bill given up for renewal,	8	1837	50
	28	12	Abram Eastman, ...	2	475	
	31	12	Balance due to me, . . .		21382	74
					26704	12

Cr.

1817.						
April	12	5	By Charles Lee, my note a 60 days,	7	4950	
	15	5	Richard Lakeman, ...	8	6050	
May	24	6	Robert Means, ...	8	297	85,7
Aug.	1	8	Rufus Perkins, ...	9	550	
	15	8	Henry Lee's account current, .	8	120	
Oct.	10	9	James Wilson, ...	9	569	
					12536	85,7

Dr. Profit and Loss,

1817.		J.F.		Cr. L.F.		
Feb.	26	3	To bills receivable, for discount on A. Young's bill,	2	11	16
Dec.	14	11	Andrew Newman, for loss by him,	7	419	61,6
	31	12	Expense account, as per J.	10	499	33
	31	13	Stock, for net gain,	1	43796	92,1
					44727	02,7

Dr. House in Hanover-street,

1817.						
Jan.	1	1	To Stock,		2500	
Mar.	18	3	Cash for repairs,	1	44	37
Dec.	31	13	Profit and Loss,		455	63
					3000	00

Dr. Land in the County of

1817.						
Aug.	1	1	To Stock, 750 acres,		562	50
Dec.	31	13	Profit and Loss,		262	50
					825	00

Dr. Ship Massachusetts,

1817.						
Jan.	1	1	To Stock,		7000	
Feb.	20	2	Cash, for repairs,	1	53	20
	28	3	ditto, for Ensurance,	1	210	75
Nov.	28	10	Reimbursements to Europe, cash,	2	1208	20
Dec.	31	13	Profit and Loss,		3557	24
					12029	39

Dr. Household Furniture,

1817.						
Jan.	1	1	To Stock,		1500	
Dec.	17	11	Piano Forte,	7	210	
Dec.	31	13	Profit and Loss,		810	
					2520	

Cr.

1817.		J.F.		Dr. L.F.	$.	C.
April	6	4	By cash, for interest on D. Jones' note,	1	2	05
July	30	7	ditto, ditto,	1	1	96
Dec.	4		Ashes, in Co. with D. Whitman and self, my half of gain,	12	84	15
	18		Voyage to Copenhagen in Co. with S. Dean and self, my half gain,	10	1525	74
	20	12	Cash, for interest,	2	86	34,4
	28	12	Cash for interest,	2	26	12,5
	30	12	Cash for interest,	2	84	50
	31	13	Sundries, per Journal,		42916	15,8
					44727	02,7

Cr.

1817.						
Aug.	18	8	By cash,	1	3000	
					3000	

Washington,

Cr.

1817.						
Jan.	27	2	By sundries,		825	
					825	

Cr.

1817.						
Nov.	27	10	By cash, for freight,	1	5054	39
Dec.	25	12	Vancouver and Sons,	12	6975	
					12029	39

Cr.

1817.						
Aug.	19	8	By cash,	1	2300	
Dec.	30	12	Cash, Piano Forte,	2	220	
					2520	

Dr. Broadcloth,

1817.		J.F.		Yds.	Cr. L.F.	$.	C.
Jan.	1	1	To Stock, *a* $3,50 per yard, . .	250		875	
Feb.	22	2	Sundries, *a* $3,50 per yd. . .	500		1750	
Dec.	31	13	Profit and Loss, . . .			562	50
				750		3187	50

Dr. Linen,

1817.				Yds.			
Jan.	1	1	To Stock, *a* ,80 per yd. . .	400		320	
	18	1	Andrew Newman, *a* ,70 per yd.	1000	7	700	
Dec.	31	13	Profit and Loss, . .			520	
				1400		1540	

Dr. Port wine,

1817.				Hhds.			
Jan.	1	1	To Stock, *a* $45 per hhd. .	7		315	
	15	1	Cash, *a* $42 per hhd. . .	8	1	336	
Dec.	31	13	Profit and Loss, . . .			139	
				15		790	

Dr. Sugar,

1817.				Cwt.			
Jan.	1	1	To Stock, *a* $10,50 per cwt. . .	240		2520	
	19	1	Cash, *a* $10,72,6$\frac{4}{21}$ per cwt. .	84	1	901	
Dec.	31	13	Profit and Loss, . . .			549	50
				324		3970	50

Dr. Rum,

1817.				Gals.	Pun.			
Jan.	1	1	To Stock, *a* $125 per pun. .		12		1500	
Mar.	19	3	Cash, *a* $1,25 per gallon,	120		1	150	
Dec.	31	13	Profit and Loss, . .				111	
							1761	

Dr. Thomas Lamson,

1817.						
Jan.	1	1	To Stock, ...			400

Cr.

1817.		J.F.		Yds.	Dr. L.F.	$.	C.
Oct.	30	9	By sundries, *a* $4,25 per yd. . .	750		3187	50
						3187	50

Cr.

1817.				Yds.			
Feb.	10	2	By cash, *a* $1,10 per yd. .	400	1	440	
	25	3	Bills receivable, A. Young, *a* $1,20	600	2	720	
Oct.	25	9	Cash, *a* ,95 . . .	400	1	380	
				1400		1540	

Cr.

1817.				Hhds.			
Feb.	10	2	By Joseph Brigham, *a* $55 per hhd.	5	7	275	
Dec.	9	11	Cash, *a* $51,50 per hhd. . .	10	2	515	
				15		790	

Cr.

1817.				Cwt.			
Jan.	2	1	By Charles Lee, *a* $12,50 per cwt.	72	7	900	
	20	1	Coffee, *a* $12 per cwt. . .	84	5	1008	
Mar.	20	3	Robert Means, *a* $12,25 per cwt.	150	8	1837	50
April	4	4	Robert Means, *a* $12,50 . .	18	8	225	
				324		3970	50

Cr.

1817.				Pun.			
Jan.	7	1	By Cash, *a* $135 per puncheon, .	9	1	1215	
April	4	6	R. Means, *a* $1,25 per gal. 120 gal.		1	150	
June	18	7	Cash, *a* $132 per pun. . . .	2	9	264	
	30	4	James Wilson, *a* $132 . . .	1	8	132	
			120 gals.	12		1761	

of Boston, **Cr.**

1817.						
Jan.	29	2	By Cash, ...	1	400	

Dr. Amos Locke,

1817.		J.F.		Cr. L.F.	$.	C.
Jan.	1	1	To Stock, ...		275	

Dr. James Lewis,

1817.						
Jan.	12	1	To Cash, ...	1	140	

Dr. Lemuel Samson,

1817.						
Jan.	28	2	To Cash, ...	1	800	

Dr. James Munson,

1817.						
Jan.	24	2	To Cash, ...	1	2050	

Dr. Joseph Franklin,

1817.						
Jan.	24	2	To Cash, ...	1	1500	

Dr. Gin,

1817.				Gals.			
May	18	6	To Cash, *a* $1,55 per gal.. . .	376	1	582	80
Dec.	31	13	Profit and Loss			94	
						676	80

Dr. Coffee,

1817.				lb.			
Jan.	20	1	To sugar, *a* ,25 per lb.	4032	4	1008	
July	15	7	Rufus Perkins, *a* ,22 per lb. . .	2500	9	550	
Dec.	31	13	Profit and Loss, ...			303	62
				6532		1861	62

Dr. Flour,

1817.				Bar.			
Feb.	15	2	To Cash, *a* $8,75 per bar. . . .	220	1	1925	
Dec.	31	13	Profit and Loss, . . .			510	
						2435	

of Salem, Cr.

1817.		J.F.		Dr. L.F.	$.	C.
Jan.	31	2	By Cash, ...	1	275	

of Boston, Cr.

1817.					
Jan.	1	1	By Stock, ...		140

of Boston, Cr.

1817.					
Jan.	1	1	By Stock, ...		800

of Boston, Cr.

1817.					
Jan.	1	1	By Stock, ...		2050

of Boston, Cr.

1817.					
Jan.	1	1	By Stock, ...		1500

Cr.

1817.				Gals.			
Oct.	5	9	By Andrew Newman, *a* $1,80 .	376	7	676	80
						676	80

Cr.

1817.				lb.			
June	22	7	By cash, *a* ,28 per lb.	3266	1	914	48
Dec.	12	11	ditto, *a* ,29 per lb.	3266	2	947	14
				6532		1861	62

Cr.

1817.				Bar.			
Mar.	7	3	By cash, *a* $10,25 per bar. . . .	100	1	1025	
Aug.	31	8	ditto, *a* $11,75 . . .	120	1	1410	
				220		2435	

Dr. Tea,

1817.		J.F.		lb.	Cr. L.F	$.	C.
Feb.	18	2	To David Whitman, *a* $1,25 per lb.	1250	8	1562	50
Dec.	31	13	Profit and Loss, ...			283	75
						1846	25

Dr. Ashes,

1817.				cwt.qr.lb.			
April	4	4	To R.Means, *a* $4,94 $\frac{6}{7}$ per cwt.	45 2 4	8	225	
May	20	6	R. Means, *a* $6 per cwt.	49 2 16	8	297	85,7
				95 0 20		522	85,7

Dr. Fish,

1817.				Qnt.		
April	15	5	To Richard Lakeman, *a* $3,50 .	3400	8	11900

Dr. Tow cloth,

1817.				Yds.		
April	4	4	To Robert Means, *a* ,25 per yd. . .	500	8	125

Dr. Oil,

1817.				Bar.		
April	15	5	To Richard Lakeman, *a* $10 . .	20	8	200
Dec.	31	13	Profit and Loss, . . .			50
						250

Dr. Shoes,

1817.				Prs.			
April	28	5	To cash, *a* ,90 per pair, ...	340	1	306	
	28	5	ditto, *a* $1,20 . . .	522	1	626	40
				862		932	40

Dr. Boots,

1817.				Prs.		
April	28	5	To cash, *a* $3 per pair, ...	120	1	360

Cr.

1817.		J.F.		lb.	Dr. L.F	$.	C.
July	25	7	By cash, *a* $1,50 . .	675	1	1012	50
Sept.	27	8	sundries, *a* $1,45 . .	575		833	75
				1250		1846	25

Cr.

1817.				cwt.qr.lb.			
May	31	6	By voya. to London, *a* $4,94 $\frac{9}{5}$ per cwt. pot, . . .	45 2 4	10	225	
	31	6	ditto, *a* ℔6 pearl, . .	49 2 16	10	297	85,7
				95 0 20		522	85,7

Cr.

1817.				Qnt.		
May	8	5	By voyage to Opo rto, *a* 3,50 . .	3400	10	11900

Cr.

1817.				Yds.		
July	25	7	By cash, *a* ,25, ...	500	1	125

Cr.

1817.				Bar.			
June	5	6	By cash, *a* ℔12,50 per barrel, . .	20	1	250	
						250	

Cr.

1817.				Prs.			
June	25	7	By voyage to New-Orleans, *a* ,90 .	340	11	306	
	25	7	ditto, . . . *a* ℔1,20 . .	522	11	626	40
				862		932	40

Cr.

1817.				Prs.		
June	25	7	By voyage to New-Orleans, *a* ℔3 . .	120	11	360

Dr. Staves,

1817.	J. F.			M.	Cr. L. F.	$.	C.
May	5	5	To cash, *a* $35 per M. . .	8	1	280	

Dr. Piano Fortes,

1817.				P. Fort.			
Nov.	1	9	To voyage to London, valued, .	6	10	807	16
Dec.	31	13	Profit and Loss, ...			347	84
						1155	00

Dr. Andrew Newman,

1817.						
April	18	5	To cash, ...	1	700	
Oct.	5	9	Gin, ...	5	676	80
					1376	80

Dr. Charles Lee,

1817.						
Jan.	2	1	To sugar, ...	4	900	
April	12	5	Bills payable, my note *a* 60 days, .	2	4950	
					5850	

Dr. Samuel Tyler,

1817.						
Feb.	2	2	To cash, lent on his bond, . .	1	2000	
					2000	

Dr. Joseph Brigham,

1817.						
Feb.	12	2	To port wine, ...	4	275	

Cr.

1817.		J.F.		M.	Dr. F.	$.	C.
May	8	5	By voyage to Oporto, a $35 . .	8	10	280	

Cr.

1817.				P. Fort.		
Dec.	16	11	By Cash, a $175. . .	3	2	525
	17	11	Household furniture, a $210	1	3	210
	27	12	Cash, a $210 . .	2	2	420
				6		1155

of Portland, Cr.

1817.						
Jan.	18	1	By Linen, ...	4	700	
Dec.	14	11	Sundries, ...		676	80
					1376	80

of Worcester, Cr.

1817.						
April	10	4	By voyage to Bourdeaux, . .	10	4950	
June	10	6	Cash, ...	1	900	
					5850	

of Boston, Cr.

1817.						
July	2	7	By cash, in part on his bond, ...	1	495	
Sept.	30	8	ditto, . ditto, . .	1	14	
Oct.	20	9	ditto, . ditto, . .	1	350	
Nov.	20	10	ditto, . ditto, . .	1	870	
Dec.	20	12	ditto, in full of principal, ...	2	271	
					2000	

of Charleston, Cr.

1817.						
April	20	5	By cash, ...	1	275	

Dr. Robert Means,

1817.		L.F.		Cr. L.F.	$.	C.
Mar.	20	3	To sugar,	4	1837	50
April	4	4	Sundries,		375	
May	24	6	Bills payable, *a* 30 days,	2	297	35,7
Dec.	1	10	Cash, p'd him in Co. with D. W. & self,	2	2040	
	20	12	Bills rec'ble, his bill given up for rene.	2	1837	50
					6387	85,7

Dr. Winslow Lamb,

1817.					
April	26	5	To cash, for balance,	1	875
Sept.	27	8	Tea, *a* 60 days,	6	255
					1130

Dr. David Whitman,

1817.					
April	24	5	To cash,	1	1562 50

Dr. Henry Lee, his account

1817.				Hhds.			
Mar.	1	3	To cash, for freight,	15	1	41	25
	10	3	ditto, for truckage,		1	11	25
	27	4	ditto, for weighing,		1	5	50
	30	4	ditto, for storage,		1	10	50
	30	4	Commission ac't. for my com.		9	25	88,2
	30	4	His ac't. cur't. for net proceeds,		8	846	79,1
						941	17,3

Dr. Richard Lakeman,

1817.					
April	15	5	To sundries, as per Journal,		12100

Dr. Henry Lee's account

1817.						
Mar.	31	4	To cash, remitted him by mail,	1	500	
Aug.	15	8	Bills payable, draft on myself, in favour of C. Lee,	2	120	
	20	8	Cash, in full,	2	226	79,1
					846	79,1

of Amherst, Cr.

1817.		J.F.		Dr. L.F.	$.	C.
Mar.	24	3	By bills payable, *a* 9 months,	2	1837	50
April	4	4	Sundries,		350	
May	20	6	Ashes, pearl,	6	297	85,7
July	3	7	Cash,	1	25	
Nov.	30	10	Ashes, in Co. with D. Whitman & self,	12	2040	
Dec.	20	12	Bills rec'ble, his bill renewed, *a* 4 mo.	2	1837	50
					6387	85,7

of Salem, Cr.

1817.						
Feb.	22	2	By broadcloth—balance,	4	875	
Nov.	28	10	Cash,	1	255	
					1130	

of Boston, Cr.

1817.						
Feb.	18	2	By tea,	6	1562	50

of Tobacco, Cr.

1817.				Hhds.			
Mar.	4	3	By bills receivable, for	4	2	286	62
	14	3	Cash,	8	2	460	52,5
	24	3	ditto,	3	2	194	02,8
				15			
						941	17,3

of Ipswich, Cr.

1817.						
April	15	5	By sundries, as per Journal,		12100	

current, Cr.

1817.						
Mar.	30	4	By his ac't. of tobacco, for net proceeds,	8	846	79,1
					846	79,1

Dr. James Wilson,

1817.		J.F.		Cr. L.F.	$.	C.
June	30	7	To rum,	4	132	
Oct.	10	9	Bills payable, *a* 30 days,	2	569	
					701	

Dr. Samuel Dean, Boston,

1817.						
June	20	6	To his account in Co. for his ½ voyage to Copenhagen,	9	5867	50

Dr. Samuel Dean, Boston,

1817.						
Dec.	5	11	To cash, in part, for net proceeds on voyage to Copenhagen,	2	5867	50
	31	13	Balance due to him,		1525	74
					7393	24

Dr. Thomas Mackay,

1817.						
July	12	7	To cash in full,	1	1200	

Dr. Amasa Goodhue,

1817.						
July	20	7	To cash in full,	1	10500	

Dr. Rufus Perkins,

1817.						
Aug.	1	8	To bills payable, *a* 30 days,	2	550	

Dr. E. Nichols & Sons,

1817.						
Aug.	8	8	To cash in full,	2	4600	

Dr. Commission

1817.						
Dec.	31	13	To Profit and Loss,		54	33,2
					54	33,2

of Lynn, Cr.

1817.		J.F.		Dr. L.M.	$.	C.
Oct.	9	9	By Vender Effingin's account current,	11	569	
Dec.	13	11	Cash, in full, ...	2	132	
					701	

his account current, Cr.

1817.						
June	21	6	By Cash, for his half voyage in Co. to Copenhagen, ...	2	5867	50

his account in Co. Cr.

1817.						
June	20	6	By his ac't. current, for his ½ voyage to Copenhagen, . . .	9	5867	50
Dec.	18		Voyage to Copenha. for his ½ share gain,	10	1525	74
					7393	24

of Boston, Cr.

1817.						
June	20	6	By voyage to Copenhagen, in Co. with S. Dean and Self, . . .	10	1200	

of Newburyport, Cr.

1817.						
June	20	6	By voyage to Copenhagen, in Co. with S. Dean, and Self, . . .	10	10500	

of Beverly, Cr.

1817.						
July	15	7	By Coffee, ...	5	550	

of Boston, Cr.

1817.						
April	10	4	By voyage to Bourdeaux, . .	10	4600	

Account, Cr.

1817.						
Mar.	30	4	By H. Lee's tobacco, my commission,	8	25	88,2
Oct.	9	9	Vender Effingin, . . .	11	28	45
					54	33,2

Dr. Expense.

1817.		J.F.		Cr. L.F.	$.	C.
April	6	4	To cash, men's wages, &c. . .	1	120	25
July	1	7	ditto, ditto, . . .	1	119	24
Oct.	1	9	ditto, ditto, . . .	2	127	44
Dec.	30	12	ditto, ditto, . . .	2	132	40
					499	33

Dr. Voyage to Bourdeaux,

1817.						
April	10	4	To sundries, as per Journal, . .		9880	20
	10	4	Cash, for Ensurance, . .	1	371	25,7
Dec.	31	13	Profit and Loss, . . .		4568	84,3
					14820	30

Dr. Voyage to Oporto,

1817.						
May	8	5	To sundries, as per Journal, . .		12191	50
	15	6	Cash, for Ensurance, . .	1	525	75
Dec.	31	13	Profit and Loss, . . .		5580	
					18297	25

Dr. Voyage to London,

1817.						
May	31	6	To sundries, as per Journal, . .		538	10,7
Nov.	5	9	Cash, paid at the C. house, freight, &c.	2	115	50
Dec.	31	13	Profit and Loss, . . .		153	55,3
					807	16

Dr. Voyage to Copenhagen,

1817.						
June	20	6	To sundries, as per Journal, . .		11735	
Dec.	18		S. Dean's ac't. in Co. for his ½ net gain,	9	1525	74
	18		Profit and Loss, for my half ditto, .	3	1525	74
			Rule XLI.		14786	48

Account, Cr.

1817.		J.F.		Dr. L.F.	$.	C.
Dec.	31	13	By Profit and Loss, ...	3	499	33
			Note. This account is balanced by Profit and Loss, because the several things which are made Dr. are of no value in a mercantile way, but an entire loss.			
					499	33

Consigned to Charles Leroi, Cr.

1817.						
Nov.	8	9	By Charles Leroi, my account current, for net prpceeds, ...	11	14820	30
					14820	30

Consigned to Francisco Alvardo & Co. Cr.

1817.						
Oct.	15	9	By Francisco Alvardo & Co. my account current, for net proceeds, . . .	11	18297	25
					18297	25

Consigned to S. Turner, Cr.

1817.						
Nov.	1	9	By S. Turner, my account current, for net proceeds, by the Galen, . .	7	807	16
					807	16

in Co. with Samuel Dean and Self, Cr.

1817.						
Nov.	6	9	By Jacob Vantorff, our account current, for net proceeds, ...	11	14786	48
					14786	48

Dr. Voyage to New-Orleans,

1817.		J.F.		Cr. L.F.	$.	C.
June	25	7	To sundries, as per Journal, . .		1302	60
Dec.	31	13	Profit and Loss, ...		103	20
					1405	80

Dr. Voyage from

1817.						
Sept.	3	8	To Kingman Turrel, my account current, for net proceeds, ...	12	1405	80
	4	8	Cash, for charges, ...	2	134	50
Dec.	31	13	Profit and Loss, ...		344	75
					1885	05

Dr. Vender Effingin, of Amsterdam,

1817.					
Oct.	9	9	To sundries, as per Journal, . .	619	55
Dec.	31	13	Profit and Loss, ...	123	71
				742	26

Dr. Jacob Vantorff,

1817.						
Nov.	6	9	To voyage in Co. to Copenhagen, for net proceeds, ...	10	14786	48

Dr. Francisco Alvardo & Co.

1817.						
Oct.	15	9	To voyage to Oporto, for net proceeds,	10	18297	25

Dr. Charles Leroi,

1817.						
Nov.	8	9	To voyage to Bourdeaux, for net proceeds,	10	14820	30

Dr. Voyage from

1817.						
Nov.	12	10	To C. Leroi, my ac't. cur't. for net proc's.	11	14820	30
	13	10	Cash, paid at the Custom house, &c.	2	784	50
Dec.	31	13	Profit and Loss, ...		10535	68
					26140	48

Consigned to Kingman Turrel, Cr.

1817.		J.F.		Dr. L.F.	$.	C.
Aug.	28	8	By K. Turrel, my account current, for net proceeds, ...	12	1405	80
					1405	80

New-Orleans, Cr.

1817.						
Sept.	12	8	By Cash, K. Turrel, for net proceeds, . .	1	1885	05
					1885	05

his Account Current, Cr.

1817.						
Dec.	6	11	By Bills receivable, on Rufus Perkins, . .	2	742	26
					742	26

our Account Current, Cr.

1817.						
Dec.	18	11	By cash, for net proceeds, . . .	2	147	

Oporto, my Account Current, Cr.

1817.						
Nov	18	10	By voyage from Oporto, .. .	12	18297	25

my Account Current, Cr.

1817.						
Nov.	12	10	By voyage from Bourdeaux, for net proc's.	11	14820	30

Bourdeaux, Cr.

1817.						
Dec.	15	11	By sundries, sales at auction, for net proceeds, ...		26140	48
					26140	48

Dr. Voyage from

1817.		J.F.		Cr. L.F.	$.	C.
Nov.	18	10	To Francisco Alvardo & Co. my account current, for net proceeds, . .	11	18297	25
	19	10	Cash, paid for duties, &c. .	2	1010	40
Dec.	31	13	Profit and Loss, . . .		12895	51
					32203	16

Dr. Kingman Turrel,

1817.						
Aug.	28	8	To voyage to New-Orleans, for net proc's.	11	1405	80

Dr. David Whitman,

1817.						
Nov.	30	10	To his account in Co. for his half of Ashes, bought of R. Means, . . .	12	1020	

Dr. David Whitman's

1817.						
Dec.	4	11	To cash, in part, for his share of net proceeds on Ashes, in Co. . .	2	1020	
	31	13	Balance due to him, . . .		84	15
					1104	15

Dr. Ashes, in Co. with

1817.				cwt.			
Nov.	30	10	To Robert Means, *a* $6 per cwt. .	340	8	2040	
Dec.	3	11	Cash, paid for charges, . .		2	86	70
	4	13	D. W's ac't. in Co. for his ½ net gain,		12	84	15
	4	13	Profit and Loss, for my ½ net gain,		3	84	15
			Rule XLI.			2295	

Dr. Vancouver & Sons,

1817.						
Dec.	25	12	To Ship Massachusetts, . . .		3	6975

Dr. Balance Account,

1817.						
Dec.	31	13	To sundries, as per Journal, . .		63444	31,1
					63444	31,1

N. B. The several articles under the head of Balance, on the Dr. side, are brought from the Cr. side of that particular account, which is made Cr. "*By Balance.*" The amount of these articles constitute your net estate in cash, goods, and debts due to you by others. In opening new books, each of them must be made Dr. to Stock, because each particular is part of Stock.

Oporto, Cr.

1817.		J.F.		Dr. L.F.	$.	C.
Nov.	25	10	By cash, for port wine, net proceeds, .	1	32203	16
					32203	16

my Account Current, Cr.

1817.						
Sept.	3	8	By voyage from N. Orleans, for net proc's.	11	1405	80

his Account Current, Cr.

1817.						
Dec.	2	10	By cash in full, ...	2	1020	

Account in Co. Cr.

1817.						
Nov.	30	10	By his account current, for his ½ Ashes, bought of R. Means, . .	12	1020	
Dec.	4	11	Ashes, in Co. for his ½ share gain, .	12	84	15
					1104	15

David Whitman and Self, Cr.

1817.				cwt.			
Dec.	2	10	By Cash, *a* $6,75 per cwt. . . .	340	2	2295	
						2295	

New-York, Cr.

1817.						
Dec.	26	12	By bills receivable, *a* 4 months. . . .	2	6875	

Cr.

1817.						
Dec.	31	13	By Sundries, ...	1	1609	89
	31	13	Stock, the net of my net stock, .		61834	42,1
					63444	31,1

N. B. The articles on the Cr. side of the balance account, (the last only excepted,) are brought from the Dr. side of that particular account which is Dr. "*to Balance.*" The sum of these articles constitute what you owe, or stand indebted to others; and as your Stock is bound to make good those debts, so in the next set of books, Stock must be made Dr. to every one of them, which are to be considered as so many creditors to whom you are indebted. The last article only, where Balance is made Cr. by Stock, exhibits the net of your whole estate, and what you are worth after your debts are paid. This balance is entered on the Cr. side, (except where the debts exceed,) and in your next set of books, Stock must be credited with the same, for the whole quantity and value, because each particular is Dr. to Stock for its respective quantity and value. If

GENEBAL TRIAL BALANCE.

		1		2		3		4	
Titles of Accounts.	LF	Dr. $.	C.	Cr. $.	C.	Balance. Dr. $	C.	Cr. $.	C.
Stock,	1	4490	—	22527	50	—	—	18037	50
Cash,	2	107039	62,6	65478	05,5	41561	57,1		
Bills Receivable,	2	26704	12	4821	38	21882	74		
Profit and Loss,	3	430	77,6	1810	86,9			1380	09,3
House in Hanover-st	3	2544	37	3000	—			455	63
Land,	3	582	50	825	—			262	50
Ship Massachusetts,	3	8472	15	12029	39			3557	24
Household Furniture	3	1710	—	2520	—			810	
Broadcloth,	4	2625	—	3187	50			562	50
Linen,	4	1020	—	1540	—			520	
Port wine,	4	651	—	790	—			139	
Sugar,	4	3421	—	3970	50			549	50
Rum,	4	1650	—	1761				111	
Gin,	5	582	80	676	80			94	
Coffee,	5	1558	—	1861	62			303	62
Flour,	5	1925	—	2435	—			510	
Tea,	6	1562	50	1846	25			283	75
Oil,	6	200	—	250	—			50	
Piano Fortes,	7	807	16	1155	—			347	84
S. Dean's ac't. in Co.	9	5867	50	7393	24			1525	74
Commission,	9	—		54	33,2			54	33,2
Expense ac't.	10	489	33	—		499	33		
Voya. to Bourdeaux,	10	10251	45,7	14820	30			4568	84,3
Oporto,	10	12717	25	18297	25			5580	
London,	10	653	60,7	807	16			153	55,3
N. Orleans,	11	1302	60	1405	80			103	20
Voya. fr. N. Orleans,	11	1540	30	1885	05			344	75
Vender Effingin,	11	618	55	742	26			123	71
Voya. fr. Bourdeaux,	11	15604	80	26140	48			10535	68
Oporto,	12	19307	65	32203	16			12895	51
D. Whit's ac't. in Co.	12	1063	35	1147	50			84	15
Proof,						63943	64,1	63943	64,1

MONTHLY TRIAL BALANCE.

1817.		Dr. $.	C.	Cr. $.	C.
January	31	38067	50	38067	50
February	28	10006	45	10006	45
March	31	7276	71,6	7276	71,6
April	30	45363	65,7	45363	65,7
May	31	15000	49,1	15000	49,1
June	30	32183	08	32183	08
July	31	20376	55,7	20376	55,7
August	31	13732	59,1	13732	59,1
September	30	4823	10	4823	10
October	31	24206	54	24206	54
November	30	115485	88	115485	88
December	31	80477	61,9	80477	61,9
Proof,					

PROFIT AND LOSS SHEET.

Dr. Profit and Loss, Cr.

TITLES.	L.F.	$.	C.	TITLES.	L.F.	$.	C.
Expense account,	10	499	33	House in Han.-st.	3	455	63
In Leger, page	3	430	77,6	Lands, . . .	3	262	50
				Ship Massachus'ts.	3	3657	24
		930	10,6	Household furni.	3	810	
				Broadcloth, . . .	4	562	50
				Linen, ...	4	520	
				Port wine, . . .	4	139	
				Sugar, ...	4	549	50
				Rum, ...	4	111	
				Gin, ...	5	94	
				Coffee, ...	5	303	62
				Flour, ...	5	510	
				Tea, ...	6	283	75
				Oil, ...	6	50	
				Piano Fortes, . .	7	347	84
				Commission, . .	9	54	33,2
				Voya. to Bourd'x.	10	4568	34,3
				——— Oporto,	10	5580	
				——— London,	10	153	55,3
				——— N.Orleans	11	103	20 .
				—— fr. N.Orleans	11	344	75
				Vender Effingin,	11	123	71
				Voya. fr. Bourd'x.	11	10535	68
				——— Oporto,	12	12895	51
						42916	15,8
To Stock, for net gain, . .	3	43796	92,1	In Leger, page	3	1810	86,9
		44727	02,7			44727	02,7

BALANCE SHEET.

Dr. Balance Account, Cr.

To Cash, . . .	2	41561	57,1	By Samuel Dean's			
Bills receivable,	2	21882	74	ac't. in Co. .	9	1525	74
				D.Whitman's, do.	12	84	15
				Stock, net of my			
				estate, . .	1	61834	42,1
		63444	31,1			63444	31,1

APPENDIX.

THE following concise description of the secondary or auxiliary books will suffice to give the young book-keeper an idea of their form and use.

1. *Cash Book.*

The use of this book is to shorten the cash account in the Leger, to which is transferred the account of cash received and paid out each month. Instead of this book, some merchants open a "*cash account*," in the Leger. By the cash book the merchant can at any time ascertain the exact sum of money on hand, without the trouble of telling it over. For its form, see Cash Account, Leger p. 1 & 2.

2. *Bill Book.*

The merchant by this book is enabled to ascertain the *time*, when bills or other debts become due payable *to* or *by* him. It consists of a folium for each month. The sums to be received are entered on the left hand page, and those to be paid on the right hand. Bills receivable are those which the merchant receives in payment of some debt or contract, and bills payable are such as are drawn upon him, and which he must pay when due. For the form of the book and bill, draft or note of hand, see Appendix, Nos. I. II. IX.

3. *Invoice Book.*

An invoice is a paper sent off with goods exported, either for the merchant's account or for others. It is headed generally with the name of the *ship*, *master*, *place where bound*, and of the person to whom the consignment is made. This book, containing the copies of invoices sent off, is sometimes called the invoice *outward*, to distinguish it from the invoice *inward*, which contains the copies of invoices received from abroad. For the form of invoice, see Appendix No V.

4. *Sales Book.*

This book is used to trace the net proceeds of any cargo, or consignment sold on commission. It exhibits each consignment separate and by itself, to which are subjoined the respective charges, such as freight, custom, truckage and commission, &c. The amount of these subtracted from the gross amount of sales shows the net proceeds; for which the factor gives his correspondent credit, and sends him a copy of the *account sales*, signing to it his name, with the words "*Errors Excepted.*" From this book, when a consignment is sold off, an account is drawn out, to be transmitted to the employer. For form of an "*Account Sales*," see Appendix No. VI.

5. *Account Current Book.*

This book contains the copies of such accounts as are sent to correspondents. Although they have the form of the Leger, yet they are more particular than the general entries of it; for the charges, which are collected into one sum in the Leger, may in the Journal post have several lines; therefore an exact copy is necessary to prevent disputes. The accounts should exactly correspond with the Leger, omitting the terms, "*Sundries*," "*Notes payable*," "*Notes*

receivable," *Expense account*," &c.; by which the Leger account has been either debited or credited. For the form of an Account Current, see Appendix No. VII.

6. *Commission Book.*

This book contains a fair copy of all orders received from correspondents, by which the merchant should carefully regulate his conduct in transacting business for others, that he may avoid all losses arising from mistakes committed by himself.

7. *Book of Ship's Account.*

This, like the invoice book, contains too many particulars to be left to the entry of the Waste-book. All the expenses, from the arrival to the sailing of the ship, should make but one entry.

8. *Expense Account Book.*

It contains the daily expenditures, such as men's wages and other incidental charges. The prudent merchant will ever feel anxious to know the amount of his contingent expenses, the better to ascertain the exact state of his income. Its form is similar to "*Cash account.*"

9. *Letter Book.*

The bad consequences which often attend the neglect of preserving an exact copy of letters sent on business, have induced the careful, regular merchant, to copy, verbatim, all such letters into a large folio volume, allotted for that purpose. So that this book, with the letters received, which should be carefully kept in files, make a complete history of the mercantile transactions betwixt the merchant and his correspondent.

When an answer is received, mention at the end of the foregoing letter, the date of that, which came for answer.

When an answer is returned to any letter received, note on the letter the time of answering it.

10. *Postage Book.*

It contains all the letters, which the merchant receives, and sends away on account of his correspondent, for which he pays postage. The sum total is carried to the account current.

11. *Receipt Book.*

This book contains the receipts which a merchant takes for the payments he makes. The receipt should mention the date, sum received, expressed in words at large, and in figures in the money columns; the reason, whether in full or in part, and must be signed by the person receiving. For the form of Receipts, See Ap. No. VIII.

12. *Check Book.*

The form of the check book is various, but, perhaps, equally convenient. It is like the cash book, and may be kept by debit and credit. For form, see No. X.

The memorandum, or pocket book, is kept by factors in extensive business. In it is copied, from letters received, short notes of the several commissions for buying goods, contained in them. It greatly facilitates the mode of doing business, by assisting the memory without a continual reference to the letters themselves.

The preceding are the auxiliary books commonly used by different merchants, who are not, however, restricted in the use of them; but adopt such of them only as are most convenient to them, according to the nature and extent of their business.

MERCANTILE FORMS.

No. I. *BILL BOOK.*

Bills receivable, January, 1817.

J.F.	When received.	From whom received.	By whom drawn, and place.	On whom drawn, and place.	Date.	To whom payable.	Time.	Due.	Sum.
	Dec. 5	V. Effingin.	W. Vorst, Amsterdam.	R. Perkins, Boston.	Nov. 9	Th. Russell.	At sight.	Dec. 6	D. C. 742,26

No. II.

Bills payable, January, 1817.

J.F.	By whom drawn, and place.	Date.	To whom payable.	Time.	Accepted	Due.	Sum.	To whom p'd. and when.
	Henry Lee, Norfolk.	July 28	C. Lee.	10 days after sight.	Aug. 15	Aug. 27	D. 120	Charles Lee, Aug. 25.

No. III. *FOREIGN BILL.*

Form of a bill of exchange received from Vender Effingin of Amsterdam, and entered in bills receivable, as in No. I.

Gilders. Stivers.
1855 13 *a* 40 c.

Amsterdam, Nov. 1, 1817.

Thirty days after sight, pay this my first bill of exchange, (my second and third of the same tenor and date not paid) to Thomas Russell, or order, one thousand eight hundred and fifty-five gilders thirteen stivers, exchange 40 c. per gilder, for value received, and place the same to account, per advice from WILLIAM VORST.

To Rufus Perkins, Boston.

Accepted, December 6, 1817. RUFUS PERKINS.

No. IV. *INLAND BILL.*

Form of a bill drawn on me by Henry Lee, and entered in bills payable, as in No. II.

$120

Norfolk, (Virginia,) July 28, 1817.

Ten days after sight, pay to Mr. Charles Lee, or order, one hundred and twenty dollars, for value received, and place it, without further advice, to the account of your humble servant,

HENRY LEE.

To Thomas Russell, Boston.

Accepted, August 15, 1817. THOMAS RUSSELL.

N. B. A bill of exchange is a written order for money, to be received in one place or country, for value paid in another. Their style varies according as one or more bills are drawn for the same sum; or according to the time of payment, as, at sight, so long after

No. V.

Invoice of 10 hhds. tobacco, shipped on board the Mary-Ann, Capt. Hoffman, for Amsterdam, by order of Vender Effingin, merchant there, for his account and risk, and to him consigned.

Boston, Oct. 9, 1817.

V. E. No.	No.	1 gross	lb.	tare	lb.		$.	C.
	2	1574		90				
1 to 10	3	1394		89	14225 lb. *a* $4 per 100 lb.		569	
	4	1504		96	Charges.			
	5	1479		88	Shipping charges, $21,10			
	6	1584		87	Commis'n, *a* 5 p. c. 28,45			
	7	1498		90			49	55
	8	1640		100				
	9	1549		99			618	55
	10	1584		98				
	Gross,	15146	tare,	921	Errors excepted.			
	Tare,	921			Boston, Oct. 9, 1817.			
	Net,	14225	lb.		Bought of James Wilson, *a* 30 days, $569.			

No. VI.

Sales of 15 hhds. tobaoco, received per brig Favorite, and sold by order, and for account and risk of Henry Lee, of Norfolk, (Vir.)

1817		Dr.	$.	C.	1817.		Cr.	$.	C.
Mar.	1	To cash, paid freight, 15 hhds. fr. Norfolk, received per brig Favorite, . . .	41	25	Mar.	4	By W. Paterson's bill, *a* 90 days, for 4 hhds.		
	10	Cash, p'd truckage, ...	11	25			No. 1 gross, 10 3 14 ta. 145 lb.		
	27	Cash, p'd weighing, &c. . . .	5	50			2 . 11 2 17 150		
	30	Cash, Storage,	10	50			3 9 3 24 135		
		Commission, *a* 5 per cent. . .	25	88,2			4 10 0 27 140		
		Henry Lee, for net proceeds,	846	79,1			42 2 25 570		
							Makes 4215 lb. net, *a* D.6,80 per 100 lb. .	286	62
						14	By cash, 8 hhds.		
							No. 5 gross 8 2 13 ta. 135 lb.		1
							6 9 1 140		
							7 10 0 14 138		
							8 8 3 15 145		
							9 7 3 23 125		
							10 9 1 13 132		
							11 10 0 14 140		
							12 8 2 14 130		
							72 3 22 1085		
							Is 7085 lb. net, *a* D.6,50 per 100 lb. . .		
						24	By cash, 3 hhds.	460	52,5
							No. 13 gross 9 2 12 ta. 146 lb.		
							14 8 3 27 138		
							15 10 1 13 148		
							28 3 24 432		
							Is 2812 lb. net, *a* D.6,90 per 100 lb. . . .	194	02,8
		Errors excepted.							
		Boston, March 30, 1817.							
			941	17,3				941	17,3

No. VII. *AN ACCOUNT CURRENT.*

Dr. Henry Lee, of Norfolk, in account with Thomas Russell, Cr.

1817.			$.	C.	1817.			$.	C.
Mar.	31	To cash, remitted by the mail,	500		Mar.	30	By net proceeds of 15 hhds. tobacco, as per ac't. sales rendered, ...	846	79,1
Aug.	15	Your draft, in favor of C. Lee,	120						
	20	Cash, for balance Errors excepted.	226	79,1					
		Boston, Aug. 20, 1817.	846	79,1				846	79,1

Note for the pupil. When a person or dealer not only buys from the merchant, but sells to him, or transacts business for him, so as to render the merchant Dr. to him, the account, in this case, is denominated by merchants "An Account Current."

No. VIII. *FORM OF AN ACCOUNT SALES.*

Sales of 15 hhds. tobacco, received per brig Favorite, C. Hunt, sold by order, for account and risk of Henry Lee, Norfolk.

1817.					
Mar.	4	To W. Paterson's bill *a* 90 days, for 4 hhds.			
		No. 1 gross 10 3 14 lb. tare 145 lb.			
		2 11 2 16 150			
		3 9 3 24 135			
		4 10 0 27 140			
		42 2 25 570			
		Net 4215 lb. *a* $6,80 per 100 lb. . .		286	62
	14	To cash, 8 hhds.			
		No. 5 gross 8 2 13 lb. tare 135 lb.			
		6 9 1 140			
		7 10 0 14 138			
		8 8 3 15 145			
		9 7 3 23 125			
		10 9 1 13 132			
		11 10 0 14 140			
		12 8 2 14 130			
		72 3 22 1085			
		Net 7085 lb. *a* $6,50 per 100 lb. . .		460	52,5
	24	To cash, for 3 hhds.			
		No. 13 gross 9 2 13 lb. tare 146 lb.			
		14 8 3 27 138			
		15 10 1 13 148			
		28 3 24 432			
		Net 2812 lb. *a* $6,90 per 100 lb. . .		194	02,8
		Charges.			
		Freight, ...	$41,25		
		Weighing and truckage, ...	16,75		
		Storage, ...	10,50		
		Commission, on $941,17,3 *a* 2½ per cent.	25,88,2	94	38,2
		Net proceeds, Errors excepted.		846	79,1
		Boston, March 24, 1817. Thomas Russell			

No. IX. *RECEIPTS.*

1. *A General Receipt.*

Boston, April 14, 1818. Received from Thomas Lamson, four hundred dollars, in full of all demands.

SAMUEL SAWYER.

$400

N. B. A general receipt will not discharge debts due on bonds, bills and other instruments executed by sealing and delivering; nor will it discharge negotiable notes, or inland bills.

2. *Receipt for money received on Note.*

Boston, April 14, 1818. Received from James Snow, by William Spooner, four hundred and ninety-five dollars, which is endorsed on his note of January 4, 1818.

LEMUEL VOSE.

$495

3. *Receipt for money received on Account.*

Boston, April 14, 1818. Received from Andrew Bond, fifty dollars, on account.

WILLIAM SIMSON.

$50

4. *Receipt for money received for another.*

Boston, April 14, 1818. Received from James Wilson, one hundred and fifty dollars, for account of Thomas Newman.

For Thomas Newman,
GIDEON RICE.

$150

No. X. *PROMISSORY NOTES.*

1. *A note on demand.*

Boston, April 15, 1818. For value received, I promise to pay Mr. James Scott, or order, one thousand dollars, with interest, on demand.

BENJAMIN HURD.

$1000

Attest, Jacob Ingraham.

N. B. 1. Notes of hand, draughts or orders, and acceptances, are entered in the accounts of bills receivable and payable.

2. A promissory note draws interest from the date to the payment, unless otherwise expressed in the note.

3. A note or bill is not endorsable, and consequently not negotiable, unless it is payable "*to order*;" nor is it *valid*, unless it expresses, "*for value received.*"

2. *A note by two persons.*

Boston, April 15, 1818. For value received, we, jointly and severally, promise Mr. Abram Foster, to pay him, or order, one hundred dollars in three months, with interest after.

AMOS HILL,
THOMAS [illegible]AW.

Attest, Stephen Wheeler.